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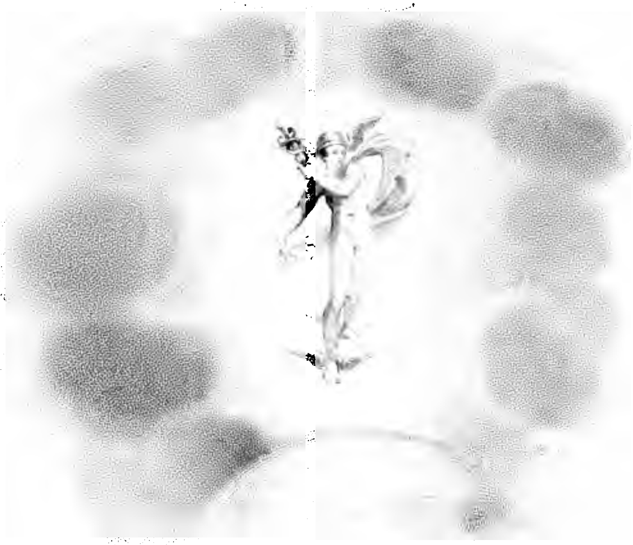

THE LONDON
Journal of Arts and Sciences,
FOR THE YEAR 1827.

An Original Work,
EXHIBITING
The Progressive advancement of Practical Science
in the various branches of
ARTS, MANUFACTURES & AGRICULTURE.

VOL. XIII.

LONDON;
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THE

LONDON JOURNAL

OF

Arts and Sciences;

CONTAINING

REPORTS OF ALL NEW PATENTS,

WITH

DESCRIPTIONS OF THEIR RESPECTIVE PRINCIPLES AND PROPERTIES;

ALSO

Original Communications

ON SUBJECTS CONNECTED WITH

SCIENCE AND PHILOSOPHY;

PARTICULARLY SUCH AS EMBRACE THE MOST RECENT

INVENTIONS AND DISCOVERIES

IN

PRACTICAL MECHANICS.

BY W. NEWTON.

VOL. XIII.

LONDON:

PUBLISHED BY SHERWOOD, GILBERT AND PIPER, PATERNOSTER
ROW; AND BY W. NEWTON, 66, CHANCERY LANE.

1827.

SHACKELL, PRINTER, 2, BARTLETT'S PASSAGE, FETTER LANE, HOLBORN.

LIST OF PLATES IN VOL. XIII.

I. Hazard's Explosive Engine, and Hanchett and Dalvalle's Improved Loom.

II. Biddle's Machine for repairing Roads; Cosnahan's Ship Meter; Cabanal's Machine for raising Water: Gillman and Sowerby's Steam Boiler; and Pyke's prop for Carriages.

III. Yandell's Refrigerators; and Gurney's Loco-motive Carriage.

IV. Gurney's Steam Boiler; Davis's Spinning Machinery; Hunter's Improved Wheels; Thin's Smoke Jack; and Day and Hall's Lace Machinery.

V. Pratt's Sea Couch; and Weatherley's Machine for Splitting and Binding Fire-wood.

VI. Galloway's Machine for making Bricks; Ulrich's Improved Chronometer; Pemberton and Morgan's Pump; and Downing's Improved Gun Lock.

VII. Perkins on high pressure Steam; Congreve's Perpetual Motion; Roberts's Miners' Safe Lamp; and Adcock's Door Lever.

VIII. Worthington and Mulliner's Loom; Saintmarc's Distilling Apparatus; Grimber's Distilling Apparatus; Young's Improved Lock; and Garsed'sMachinery for Dressing Flax.

IX. Sitlington's Shearing Machinery; Goode's Circular-Headed Window Blind; Jenour's Shot Cartridge; and Albert's Military Oven.

X. Lorent's Steam Apparatus; Jacomb's Furnace; and Teissiers Steam Engine.

XI. Perkins on Steam Valves; Perkins's Bedstead; Sadler's Power Loom; Siebe's Tell Tale for Steam Boilers; Lukins's Surgical Instrument; and Fanshaw's Spinning Apparatus.

XII. De Iongh's Self-Spinning Mule.

XIII. Lacey's Carriage Springs: Hiort's Chimneys: Tompson's Saddletree: and Tomlinson's Bedstead.

XIV. Taylor's Improved mode of making Iron: Royle's Spinning Machinery: Palmer's propelling Apparatus: and Tabor's Apparatus for shewing the depth of water in the Holds of Ships.

31502

PIRACIES

FROM THE

London Journal of Arts.

ADVERTISEMENT.

Our readers may remember that we have several times expressed (upon the wrapper of this Journal,) a feeling of displeasure, at the very unhandsome manner, in which many of our contemporary journalists have most unceremoniously appropriated our labours to their own uses and emolument. The extent to which this system of piracy has been carried on against us, few would believe; it has not been confined to the lower class of periodicals, which deal out weekly a few pennyworths of science for the amusement of the *Operatives*, (as they are emphatically styled,) but several of the better order of magazines, whose reputation stand high, and deservedly so, habitually copy a large portion of our pages, under the head of scientific intelligence; without the slightest acknowledgment of the source from whence they derive their information: and even the public newspapers in every part of the kingdom, extract anonymously, the most valuable portions of our Journal, from whence the subjects are frequently transmitted back again into the metropolitan press, and by that time the real parent through whose diligence and labour they first saw light, is lost or forgotten. In short before our journal has become three months old, the principal parts of its contents have been given to the public through fifty other sources.

Among these numerous literary pirates one weekly periodical in particular, has stood forward with the most audacious affrontery, setting our copy-right at nought; and besides paraphrasing nearly every article of our Journal, has within a short space of time copied more than sixty subjects from our plates.

Remonstrances, intreaties, threats, have all been employed without avail; the copy-right of a periodical was considered as an absurdity, and therefore, he who produced the most extensive collection of useful matter was immediately seized upon by these harpies, and his very vitals torn from him with an air of derision.

Under these circumstances, with such an accumulation of grievances, forbearance became pusillanimity, and we were reluctantly constrained to seek protection and redress from the strong arm of the law. This produced an action, and the merits of our case came on for trial on Monday, the 5th March, before Mr. Justice Gaselee, and a common Jury, at Guildhall, London, the report of which we have thought proper to lay before the public in the following pages, as a memorial of the establishment of our rights, and a caution to our contemporaries in future.

COURT OF COMMON PLEAS, LONDON,

MONDAY, MARCH 5th, 1827.

Before Mr. JUSTICE GASELEE.

NEWTON *v.* COWIE AND HEBERT.

Mr. JONES opened the case, and stated, that this was an action brought by the Plaintiff Mr. W. NEWTON, who is the Editor and Proprietor of the LONDON JOURNAL OF ARTS AND SCIENCES, against Messrs. COWIE and another, Proprietors of a weekly pamphlet, called REGISTER OF THE ARTS AND SCIENCES, for pirating from the former work, and republishing in the latter, certain plates of new mechanical inventions, the particulars of which were embraced in the nine following counts :—

1st. Murray's loco-motive steam engine; 2nd. Yardley's apparatus for making glue from bones; 3rd. Stephenson's improved axles for railway carriages; 4th. Talloch's machinery for cutting stone; 5th. Broadmeadow's blowing engine; 6th. Benecke and Shears's mode of preparing zinc or spelter; 7th. Goodman's improved loom for weaving ribbon; 8th. Harcourt's anti-friction castors; 9th. Wright's washing and bleaching apparatus. The plates of all which subjects, the Plaintiff claimed as his property, and sought damages from the Defendants for having copied and published the same without his consent, in their REGISTER OF ARTS.

Mr. FRED. POLLOCK regretted that the absence of Mr. SERJT. SPANKIE, had caused the duty of setting forth the injuries sustained by the Plaintiff to devolve upon him. The learned gentleman stated, that the LONDON JOURNAL OF ARTS AND SCIENCES, is a work got up with very considerable labour, ability, and expence. It contains an early report or description of the principle and details of every New Patent Invention, and an extensive collection of other subjects, chiefly connected with mechanical science; illustrated and embellished with finely executed copper-plate engravings, exhibiting the different machines, executed by artists of acknowledged talent, and is published by the Plaintiff, in Monthly Parts, price 2*s.* 6*d.* The work of the Defendants is a cheap periodical, sent into the world every Saturday, price 4*d.* giving accounts of patents and other new inventions, the figures of which are coarsely executed upon wooden blocks. Mr. NEWTON the Plaintiff, who is a Civil Engineer and Mechanical Draftsman, has for some years, been in the habit of travelling to different parts of the kingdom, and associating with men of science, particularly in the manufacturing districts, by which he is enabled frequently to present to the public, through the medium of the LONDON JOURNAL OF ARTS AND SCIENCES, very interesting and important communications upon the improved state of the mechanical arts; and that the public are benefited in an eminent degree by his exertions, the volume which he held in his hand would sufficiently demonstrate.

For some time past, the Plaintiff has had the mortification of seeing the result of his labours printed into other periodicals, and widely disseminated, without deriving either profit or reputation from his exertions. The Defendants have been particularly injurious to him in this respect, having, immediately after the appearance of any article of peculiar interest, in the LONDON JOURNAL OF ARTS, copied or paraphrased the language, and made some slight alterations in the figure, and then introduced it into their REGISTER, as an original communication of their own. The learned counsel would not trouble the Court with a recital of all the subjects thus surreptitiously taken by the Defendants from the Plaintiff's work, which however, he understood to exceed sixty, but would confine himself to nine very recent instances in which the Plaintiff's right had been invaded, by copying his plates, and for which the present action was brought. He had, however, to observe that he was instructed by his client, to ask in the present instance only for nominal damages, as the establishment of his copy-right, and protection from future piracies were all that he now sought.

The first count set forth, that the Plaintiff having designed and published in the 65th number of the London Journal of Arts and Sciences, a plate containing certain representations of a loco-motive engine, or steam carriage, invented by Mr. M. Murray of Leeds, and of which he, the Plaintiff, was the proprietor, the Defendants had copied and pirated the same into their Register. The remaining eight counts went on to state, that plates representing new patent inventions, had been in a similar manner piratically copied from the Plaintiff's work, and published by the Defendants.

His Lordship observed, that each count constituted a distinct action, and that if the evidence upon them all were to be taken separately, the cause would probably not be ended before midnight. He however, did not mean to object to any proceeding that might be taken, as his time was the property of the public.

Mr. Serj. Wilde argued for the Defendants, that the subjects being copies of inrolled specifications, which were public property, the Plaintiff could have no copyright in his plates.

His Lordship doubted the learned Serjeant's conclusion, and stated, that the subjects themselves were certainly common property, but the Defendants must shew that they took their drawings from the original source, and not from the Plaintiff's plates. St. Paul's Cathedral was a subject on the representation of which any artist might exercise his talents; but if one artist produced and published a picture of St. Paul's, another could not copy and publish that same view, without laying himself under the penalties of the statutes against piracy, he must go and take his drawing from the original structure.

Mr. Pollock stated, that the first count was for copying an original design, the drawing of which did not exist in the Inrollment Office, or elsewhere; and therefore must be considered apart from the other eight counts, which were avowedly designs taken from Inrolled Specifications. As it was the desire of his client not only to protect his original designs, but also to establish his copy-right in those drawings taken from Inrolled Specifications, which had cost him great labour and expence in preparing; he would take the first count as a distinct subject, and then select two or three of the other counts, upon which the fact of piracy might be argued.

Witnesses were now called to prove the purchase of the several numbers of the REGISTER OF ARTS, at the shops of the Defendants, and also to prove the Plaintiff's property in the plates published in the LONDON JOURNAL OF ARTS.

G. GLADWIN is an engraver of mechanical subjects, was employed by the Plaintiff in February, 1826, to engrave a plate of Murray's loco-motive engine, (which with the drawing, was produced in court.) On being asked to compare a print of Murray's loco-motive engine, in the REGISTER OF ARTS, with that in the LONDON JOURNAL, which he had engraved, and state, whether he considered the one to be a copy of the other, he replied, it appeared to him that the print in the REGISTER, was copied from the LONDON JOURNAL, in all its essential points; some parts were enlarged, such as the running-wheels, and others varied in a slight degree. The whole of the design had been taken, and reversed so as to give a different appearance; the variations were immaterial, not improvements, or alteration of the principle: he did not consider that the copy had been traced at the window, but taken by other means.

C. F. CHEFFINS is articled clerk to Mr. NEWTON the Plaintiff, remembers that Mr. N. was in Yorkshire in the latter part of the year 1825, and that some time after his return to London, a sketch of Murray's loco-motive engine was shewn to witness, of which he was employed by the Plaintiff to make a fair drawing, for the engraver, subject to some alterations, suggested by Mr. N.

in consequence of a letter received from the inventor. This drawing was produced.

Mr. John Farey is a civil engineer, and was formerly a mechanical draftsman, has examined and compared the prints of Murray's engine, published by the Plaintiff in the London Journal of Arts, with that published by the Defendants in the Register of Arts, considers that they are more alike than they would have been if drawn by different persons from the same original, has no doubt the latter was taken from the former, it agrees in design and scale in all its essential parts; there is a safety valve added, which every body knows, should be in some part of the boiler, and the steam pipe is carried in a different direction; that in the Plaintiff's plate is bent, to afford some degree of elasticity, and accommodate the motions of the two carriages as they pass along the railway; that in the Defendants is made nearly straight, and therefore would break as soon as the carriage began to move. The pistons are both elevated in the Defendants' plate, which could not be at the same time, in a reciprocating engine; there is also a pipe for conveying off the steam, into the chimney, which is merely indicated by dots in the Plaintiff's plate, and proposed as a variation of the design. One word has been omitted in the description in the Journal, by which it appears, that both condensing boxes and this pipe are to be used, whereas, it should have been, *Or* " after the steam has performed its office, it passes off by the pipe *w*, into the chimney," the Defendants have shewn both the boxes and this pipe, and described them, which is a clear proof they did not understand it. Some of the phrases employed by Mr. Newton, in his description, though proper, are peculiar, the same peculiarity is observable in the description given in the Register.

The witness had resided for a long time at Leeds, and been engaged at Marshall's factory, adjoining to Fenton and Murray's, he could see over the whole of the premises, and must have known if such a loco-motive engine had been made and used there; he is certain that no such engine existed, it was merely Mr. Murray's ideas communicated to Mr. NEWTON, when he was at Leeds, and has no doubt that the design was copied from the LONDON JOURNAL OF ARTS, into the REGISTER. This was the evidence upon the first count.

Mr. FAREY was shewn the prints in the two works, representing Yardley's glue apparatus, which constituted the second count, and considered them essentially the same, they appear to have been traced the one from the other, but the subjects are reversed. The digester is shewn in the JOURNAL plate in section, and empty; in the REGISTER, it is represented filled with bones; there is one wheel omitted in the latter, but in both there is a tub introduced, which is not in the inrolled specification. The prints of the JOURNAL and the REGISTER, representing Goodman's loom, described in the seventh count, were then handed to the witness, he considered them to be in every respect, fac-similes of each other, the subject being too minute to admit of variation.

The prints of Wright's washing and bleaching apparatus, described in the ninth count, were next placed in the hands of the witness. That printed in the REGISTER, is larger and wider in proportion than the print in the JOURNAL, but all the parts are presented in the same relative positions reversed. One circumstance which particularly pointed out that the Defendants had copied their account of this apparatus from the Plaintiff, was that the printer of the JOURNAL, had, by mistake, called the patentee *Samuel* Welman Wright, whereas his name is *Lemuel* Welman Wright; the REGISTER has copied the error.

Mr. SERJT. WILDE contended, that such a mistake might easily occur in both, for the original inrolled document is so extremely obscure, being written in old English, or church text hand, that he could not read it himself.

The Defendants, having brought all the original rolls, from the Inrollment Office, into Court, to be produced in their defence, the document in question, was now called for, and on being produced, the name of the patentee *Lemuel Welman Wright,* was written in a plain bold round hand.

Mr. Partington, Mr. Staple, Mr. Bacon, and several other gentlemen of Science, experienced draftsmen, and engravers, were in attendance on behalf of the Plaintiff; but Mr. Pollock considered that enough had been already elicited, and therefore he submitted to the Court, that he had made out his case.

Mr. Serj. Wilde, in conducting the defence considered that the Plaintiff had not by any means made out his case, he admired the ingenuity of his learned friend Mr. Pollock, in asking only for nominal damages, had it been possible for him to have obtained the verdict of the Jury, he could not have expected upon his several counts more than so many fractional parts of a farthing. The learned Serjt. however contended, that the Plaintiff had no copyright to maintain; 1st, It was incumbent upon him according to the Act of Parliament which applies to copyrights that he should shew that he was the original inventor and designer of the prints in question; 2ndly, That the name of the proprietors and the date of publication should be upon every plate; now, though the name of W. Newton, del. is written in the corner of all the plates, so also, is G. Gladwin, sculp. or S. Bellin, or T. Owen, or some other engraver's name, and therefore the public could not possibly know who was the real proprietor; 3rdly, The inscription, "March 1st, 1826;" or whatever date happened to be written, did not sufficiently set forth that such was really the date of the publication, and two of the plates had not even any date; and further, he was in a situation to shew, that these periodicals were *bona fide* published on the last day of the month, and not on the first, as they professed to be.

Mr. Bolland followed on the part of the Defendants, he recited the Act of Parliament of 8 Geo. II, c. 13, on the copyright of maps, prints, &c. in which it is stated, that, " every person who shall invent and design, engrave, etch, or work in mezzotinto, or chiaro oscuro, or from his own works, and invention, shall cause to be designed and engraved, etched, &c. any print or prints, shall have the sole right and liberty of printing and re-printing the same for the term of fourteen years, to commence from the day of first publishing thereof, which shall be truly engraved with the name of the proprietor on each plate." The learned counsel referred to several cases which had been decided under the same statute, but none of which appeared to apply exactly to the present case.

Mr. SERJ. WILDE again rose. With respect to the witnesses he said, who had spoken of the resemblance between two prints designed to represent the same subject he submitted it to the Jury, and should therefore decline calling any evidence as to the fact, whether it was not reasonable to expect, that two persons, describing the same invention, which consisted in some particular obvious feature, should produce the same sort of figure, differing a little indeed in some non-essential matters, just as the witnesses had described the prints to differ in the two works. As to Murray's loco-motive engine, the prints of which were said to be alike in some particular points, he could not see that they were alike at all, there were differences in the wheels, in the steam-pipe, and in the introduction of a valve, which was admitted to be an important appendage. For his part he entertained no very high opinion of the testimony of scientific men, after the recent cause of SEVERN, KING and Co. which must be in the recollection of all present, when sixteen chemists of the first talent, swore that boiling sugar in heated oil, was more safe than in steam; and sixteen other equally clever men, swore in direct opposition to the former. In short, where was the evidence to prove, that the Defendants had not received the same communications, through their correspondent Whitlaw, from Mr. Murray? Why did not the Plaintiff bring Mr. Murray to swear, that he had not communicated his invention to any other person? With respect to the similarity between the two prints, much had been said about a tub, when it was quite obvious, upon reading the specification, that a tub was essential to the apparatus. The learned Serjt. said very little upon the other points, but reminded the Jury that the Plaintiff held a responsible situation as draftsman, in the Inrollment Office, by which he had free access to every document there, and that therefore a verdict in his favor would be tantamount to a patent right, effectually excluding every other person from communicating to the public the same sort of information. He saw that the Jury had paid very great attention to the cause, and he confidently anticipated their verdict in his favour.

His Lordship addressed the Jury, observing that it was contended on the one hand that the Plaintiff had, at very considerable labour and expence, procured the information, and prepared the drawings of the various subjects, with which he had embellished his work, the LONDON JOURNAL OF ARTS AND SCIENCES; and on the other hand, that holding an official situation, he had access to the inrolled documents gratuitously. Which was the fact, he knew not, but if by virtue of his situation he had such facilities, as had been mentioned, their could be no question, but that the law would protect the fruits of his labours from piracy. There are many instances of persons holding official situations being enabled by virtue of their privilege, to produce indexes, and other matters, which are of the greatest use to the public, and was it to be sppuosed, that such productions were immediately to be copied by any other persons, who, without the labour of research, could necessarily afford them at a cheaper rate. But it appeared that the plates under consideration, were not copies of specifications, but drawings varying from the originals. There could therefore be no question, but that the Plaintiff had an exclusive right to his variations. As to the circumstance of some of the books having been procured from the Plaintiff, by wholesale houses, the night before the date of publication, his Lordship considered that to be a very trivial objection, and one which the court were bound to over-rule; but the other objection of his learned brother WILDE, that the name of the proprietor, and date of publication, did not in a satisfactory manner appear upon the plates, was a strong point, which he should reserve for the consideration of the Court; two of the plates indeed, had no date whatever upon them, though they had the proprietor's name, the others had both date and name affixed to them. These points therefore, would not be submitted to the Jury, but remain for the determination of the court above.

The evidence to which his Lordship would call the attention of the Jury, was to this effect; that the Plaintiff Newton, was proprietor of a work, he had no doubt of great merit and usefulness, called the London Journal of Arts and Sciences, and that the Defendants were publishers of another work of considerable merit also, he presumed, called Register of the Arts and Sciences. The several counts of the action stated, that the Defendants had copied from the former work, and published in their own, certain plates, exhibiting various machines. The Jury had heard the statements of the witnesses, which had been called by the Plaintiff to prove his case, and it was for the Jury to consider, whether the facts of piracy had been made out to their satisfaction. As respected several points of similarity, he confessed the evidence was strong, and particularly the coincidence of the same errors committed in both. This was always held to be a strong presumptive proof in cases of piracy. He should, however, leave the evidence with the Jury, if the fact of piracy was not satisfactorily made out, they would return a verdict for the Defendants, but if they were of opinion that the Defendant's prints or any of them, or any parts of the prints, had been copied from the plates of the Plaintiff, they would find for the Plaintiff, and as nominal damages only were asked, they would find one shilling upon each count in which the fact of piracy was proved.

The Jury retired for a few minutes, and on returning into court delivered a verdict for the Plaintiff, on the 1st, 2nd, 7th, and 9th counts, one shilling damages on each.

[*The Trial occupied nearly Six Hours, and the Court was considerably crowded.*]

COURT OF COMMON PLEAS,

MAY 28th, 1827.

NEWTON v. COWIE AND HEBERT.

MR. SERJ. WILDE having on the 5th of May obtained a rule on behalf of the Defendant, to shew cause why the verdict found for the Plaintiff on the trial of this cause, should not be set aside, and instead thereof, a non-suit entered; MR. SERJ. SPANKIE for the Plaintiff shewed cause against the rule on the 21st, and 22nd instant, and MR. SERJ. WILDE replied for the Defendant.

The Court had taken time to consider of the case, until this day, when the LORD CHIEF JUSTICE BEST delivered the judgment of the Court. After going through the facts of the case, and stating the verdict that had been found for the Plaintiff, his Lordship stated the points which had been urged by SERJ. WILDE for the Defendants, and combated by SERJ. SPANKIE for the Plaintiff. They were four in number, and turned entirely upon the construction of the acts 8th Geo. 2nd, cap. 13; 7th Geo. 3rd, cap. 38; and 17th Geo. 3rd, cap. 57; the Court were of opinion, that all the three acts must be taken as one subsisting law, and therefore that every condition required by the first act, must be complied with, to entitle a party to the benefit either of that act or of the subsequent ones, consequently as to those counts of the declaration, where the date of publication was not engraved upon the plate, the Plaintiff was not entitled to the protection of the acts. This disposed of one objection. With respect to the name of the proprietor being engraved upon the plate, an objection had been taken by the Defendants, that although the name of the Plaintiff appeared on all the plates, it was not as proprietor, but thus, " W. Newton, delin." His Lordship made some able and luminous remarks upon this objection, which our limits will not allow us to repeat; but the result was, that it appeared the way in which the Plaintiff's name was engraved was very common, and that few or no plates could be found with the proprietors name upon them as proprietor, and it would be to disturb a very large property vested in the copy right of engraved plates, if the Court were to decide that the way in which the Plaintiff's name appeared upon the plates, was not sufficient. On this point, therefore, the Court were of opinion that the Plaintiff was entitled to retain his verdict. An objection had been raised as to the first count, which related to the plate of Murray's loco-motive steam engine, that the Plaintiff had given no evidence to entitle him to the benefit of the acts, or to shew how he became possessed of the copy right, having merely proved that he delivered a drawing of the engine to his clerk, who reduced it, and then the Plaintiff had it engraved from such reduction. His Lordship made many judicious remarks upon this point also, which for the reason before mentioned we are prevented from giving to our readers, but he concluded by stating that the court entertained no doubt of the Plaintiff being entitled to the benefit of the acts as to that count. The only remaining objection was, that as to those subjects which the Plaintiff had taken from specifications enrolled in the patent office, the Plaintiff was not entitled to any copy right. This point also his Lordship argued at considerable length, and stated that the Court would be repealing the statutes if they were not to decide that the Plaintiff had a copy right in those subjeets, it would not prevent others going to the Patent Office, and there obtaining copies of the specifications, but only restrain them from making use of the labours of another.

The Plaintiff having two counts of his declaration framed upon plates which had his name and the date of publication engraved upon them, was entitled to retain his verdict, and the rule obtained by the Defendant must be discharged.

Which was accordingly done, with Costs.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LXXVII.

Recent Patents.

To Erskine Hazard, *a Citizen of the United States of North America, but now residing in Norfolk Street, Strand, in the City of Westminster, and County of Middlesex, Engineer; in consequence of a communication made to him by a certain foreigner residing abroad, and additions made by himself, for an Invention of a Method or Methods of preparing Explosive Mixtures, and employing them as a moving power for Machinery.*

[Sealed 12th August, 1826.]

This invention is a machine designed for mechanically preparing mixtures of inflammable vapours with atmospheric air, and also for exploding those inflammable vapours, for the purpose of producing a vacuum, by means of which, a power may be derived applicable to mechanical purposes.

The preparing part of the machine, consists of a metallic or other vessel, or tubes, so constructed that a stream or current of atmospheric air may pass, together with the inflammable vapour through a considerable space, interrupted by short turns or other impediments; the object of which is to mix and blend the air and the vapour thoroughly with each other, by which union they are rendered highly explosive.

This contrivance admits of an endless variety of modifications, that one represented in Plate I, at fig. 1, is proposed as a simple and convenient apparatus, adapted for the purpose. It consists of an oblong box of tin or other metallic plates, divided horizontally into four compartments, by the partitions *a*, *a*, *a*, which extend alternately from one end of the box to within a short distance of the other end, so that air entering the lower compartment at *b*, would be compelled by the partitions to travel the whole length of the box through each compartment, in its ascent to the top. These compartments are divided by the vertical partitions *c*, *c*, running the whole length of the box, into half-inch spaces, which produces the two-fold advantage of increasing the friction of the particles of vapour and air with each other, and also of preventing violence in the event of an explosion, should such an accident take place within the box. There is a tube *d*, for the admission of air and the other materials into the lower compartment at *b*, and another tube *e*, for the outlet of the explosive mixture from the upper compartment, each covered with a wire gauze to prevent explosion which completes the preparing vessel.

The exploding part of the machine also admits of a great variety of construction, of which figs. 2 and 3, may serve as an example; fig. 2, is a front view of the apparatus; fig. 3, a section taken transversely; A, is a cylinder of brass, copper, or other material, fitted with a plunger or piston B, connected with a crank shaft C, as in a steam-engine. The lower end of the cylinder has a valve D, of at least half its diameter opening outwards. This valve D, may be made very simply by a rim of leather, or other flexible substance of the same diameter, as the opening into the cylinder. This rim of leather is to be tied round the lower end of the cylinder, so as to form a continuation of it. The bottom part of the leather is to be flattened so as to bring its sides together, for four or five inches of its length, and to be kept in that position by slight springs, attached to the edges of the flat part, something like a bow and bow-string. This valve is supported or prevented from being pushed into the cylinder by a plate of metal, of sufficient thickness to bear the pressure of the atmosphere, arched or curved outward, and perforated with as many holes of one eighth or one quarter of an inch diameter, as can conveniently be made in it. The end of the cylinder forms the abutment to the arched plate.

A valve E, opening outwards, is fixed in the side of the cylinder at the bottom, for the purpose of admitting air to the interior. The inflammable vapour is passed from the preparing box F, (shewn detached at fig. 1,) through a pipe *e, e,* which extends entirely round the cylinder, at the depth of about one-sixth of the stroke of the piston from the top. The cylinder is perforated with small holes, in that part embraced by the pipe *e*, for the passage of the inflammable vapour to the interior. The neck of this pipe *e*, should be as short as possible, to prevent the vapour condensing before it reaches the cylinder, and should be furnished with a valve *f*, next the preparing vessel to cut off the communication between it and the cylinder, while the explosion takes place. A small valve *g*, next the cylinder opening outwards permits the inflammable vapour to be ignited by the flame of a lamp *h*; these valves being worked by cams, *i*, *k*, on the revolving crank shaft, or by any other convenient method.

A perforated plate of thin metal *l*, is introduced into the cylinder below the piston B, supported and guided by small rods *m*, *m*, working sufficiently tight in a stuffing box in the piston B. This plate *l*, ascends and descends with the piston, and is prevented from rising higher than the vapour pipe *e*, by the upper ends of its rods *m*, *m*, striking a stationary part above. In this situation it forms a partition between the explosive mixture, and the air in the lower part of the cylinder. A wire gauze should also be placed between the vapour valve *f*, and inflaming valve *g*, to prevent explosion, should the former not close in time. It will be seen at fig. 2, that there are two cylinders fitted up in this way, and communicating with the same preparing vessel and crank shaft.

To prepare the explosion mixture, there must be a small quantity of alcohol, or alcohol and water, either alone or mixed with spirit of turpentine, or spirit of turpentine and water, or any other inflammable materials, capable of evaporation, introduced into the lower compartment of the vessel F. A lamp *n*, or other heat if necessary, is now to be placed under the preparing vessel, for the purpose of raising the temperature, and keeping the materials about blood heat. The flame of a lamp *h*, is also to be stationed at the inflaming valve *g*. If too much vapour is raised in proportion to the quantity of air, the mixture ceases to be explosive.

The piston B, in its ascent would cause a partial vacuum in the cylinder, but this is prevented by raising the valve E, which supplies the cylinder with air till B, reaches the pipe *e*, here the perforated plate *l*, stops, while the piston B, continues its motion to the top of the cylinder; the air-valve E, is now closed, and the remainder of the cylinder above *l*, is supplied with explosive mixture through the pipe *e*, from the preparing box. Just before the piston B, reaches the end of its stroke, the inflaming valve *g*, opens, and the flame of the lamp communicating to the vapour, causes an explosion which instantly drives out the contents of the cylinder through the perforated arched plate *l*, and flexible leathern valve D, which leather valve immediately collapses again to prevent the return of the air.

The steam formed by the explosion, is condensed by keeping the cylinder below the pipe E, cool, by surrounding it with water in the jacket O, O, and by injecting a jet of water through the cock *p*, (which is also worked by a cam *q*, on the crank shaft.)

The vacuum being formed under the piston B, it descends by the pressure of the atmosphere, and its connecting rods communicate motion to the crank-shaft, in the same way as in ordinary steam-engines; and a similar operation being carried on in the second cylinder, the power is taken from the crank-shaft, and employed as a moving power.

This machine admits of so much variety of construction by combinations of different pieces, common to steam-engines, and other machinery, that the patentee does not intend to claim any particular construction or form, his object being:—" 1st, to secure the method of mixing mechanically, or by machinery, with the inflammable materials, previous to their entering the exploding chamber, such portions of atmospheric air, as they would combine with in combustion, thereby rendering them highly explosive, and enabling them to be made use of in an air-tight cylinder; 2ndly, keeping the explosive mixture separate from the atmospheric air in the cylinder, and driving out the latter without making use of it in the combustion; 3dly, the peculiar construction of the flexible valve; and lastly, preparing the explosive mixture at a temperature much below that of the boiling point."

[*Inrolled October,* 1826.]

To Richard Roberts, *of Manchester, in the County of Lancaster, Civil Engineer, for his Invention of an Improvement or certain Improvements of, in, or applicable to the Mule, Billy, Jenny, Stretching-frame, or any other Machine or Machines however designated, or named, used in spinning Cotton, Wool, or other Fibrous Substances, and in which, either the Spindles recede from, or approach the Rollers, or other deliverers of the said Fibrous Substances, or in which such Rollers or Deliverers recede from, or approach the Spindles.*

[Sealed 29th March, 1825.]

These improvements apply to such machinery for spinning wool, cotton, or other fibrous substances, as are to be actuated by the uniform power of steam or water. The movements of the mule, billy, jenny, or stretching frame, in ordinary use for spinning, is regulated by the hands of the workman, and the uniformity of its operations, that is, the degree of twist given, and backing off or coiling of the yarn upon the cop, depends entirely upon his skill; consequently it has been a desideratum, long sought, but without effect, to obtain some combination of mechanism, which should perform all the varied movements of the spinning-mule, billy, jenny, or stretching machine, and with such accuracy, as would ensure the production of perfect yarns, of uniform twist, and by the same mechanism, coil or wind them into cops.

The mechanism proposed by the patentee, appears to possess considerable ingenuity, but is, from the nature of the business it has to perform, extremely complicated.

The leading features of the invention, are—1st, the levers and their appendages, which depress the faller or rod that guides the yarns on to the cops, in backing off; 2nd, a method of regulating the movements of the faller, and forming the cop to its required shape, by the assistance of a long wooden cam; 3rd, changing or reversing the motions of twisting and of backing off, as the different parts of the operation are required to be brought into action; 4th, regulating the coiling or winding of the yarn upon the cop, according to its increasing diameter, by the gradual approximating of the faller, and another similar rod, called a counter-faller.

The description of these improvements, as given in the specification of the patent, is extremely long, and far from clear, by reason of the numerous references to a multitude of letters, numbers, and detached figures, distributed over several sheets of drawing, appended to the specification, and the drawings exhibit such an accumulation of small parts of the mechanism drawn upon a scale so minute, that we are utterly unable to compress them within the compass of our Journal, in any intelligible way. We are therefore compelled, in this instance, to deviate from our usual practice, by only giving a brief and general description of the patentees intentions.

The moving power by which this machine is to be put in operation, is to be communicated from a rotatory shaft, extending along the building, from whence a band is brought down to a transverse shaft, placed immediately over the machine. Upon this tranverse shaft there are several pullies, with endless bands extending down to other fast and loose pullies, adapted to turn different parts of the machine. Let it be supposed that one of the bands by passing round a pulley, fixed to one of the rotatory shafts, causes the stretching-frame or carriage to recede, for the purpose of stretching or extending the yarn: by the time that the receding-carriage has reached its destination, a cam upon a latteral shaft has been brought to act against a lever so as to move it side-ways, and shift the band from the fast pulley on to a loose pulley, or one that slides loosely upon its axle. The spindles will now stand still until another movement has brought a clutch-box to act upon a part of the machinery which turns the spindles the reverse way, in order that they may take up or coil the yarn upon the cop in backing off.

The faller, which guides the yarns on to the cop, is brought down at the time the backing off takes place, by means of compound levers, acted upon by rotatory cams, and as the horizontal rod of the faller directs the laying of the yarns upon the cops, its movements are determined by a lever and friction-roller running along a piece of wood placed by the side of the machine called the shaper.

This piece of wood is of an irregular form, partaking of the figures of a cylinder, a cone, and a spiral; it is mounted upon an axle, and made to revolve very slowly, by means of a toothed-wheel and endless screw, connected to the main shaft by an upright spindle, so that every time the stretching carriage recedes, the friction-roller at the end of the lever last mentioned, passes along a different part of the surface of the wooden-cam, and consequently the lever acts differently upon the faller, and causes it to regulate the laying of the yarns upon the cops, in that particular form which the long wooden cam, or shaper directs.

In order to enable the spindles to take up or coil the yarn on the cops, with the same uniform degree of tension, as the diameter of the cop becomes enlarged, there is a contrivance, by means of a ratchet-wheel and click connected to a snail-wheel and lever, which causes the rods attached to the faller and counter-faller, to approach to, or recede from each other, and to act upon the yarns, so as to accelerate or retard the rotations of the bobbins, which contrivance effectually regulates the tension of the winding.

The mechanism appears to be correctly arranged in principle to effect the movements described, but as we have before hinted, is extremely complicated; cog-wheels, both cylindrical and beveled, slipping in and out of gear; friction-wheels with interrupted motions driving or stopping parts of the machinery at intervals; cams for moving the levers, clutch-boxes, straps, rods and other parts of the apparatus, are placed in various situations about the machine, which multitude of parts necessarily envolve complexity of actions, aud cause a great practical difficulty in keeping the whole properly adjusted, so as to perform all the required evolutions at the precise periods intended. Upon the whole, we consider that these suggested improvements constitute a machine highly creditable to its inventer, as respects the ingenuity of the combination, but which we fear will be found practically inefficient.

[*Inrolled September*, 1825.]

To JOHN MARTIN HANCHETT, *of Crescent Place, Blackfriars', in the City of London, and* JOSEPH DELVALLE, *of White-cross Street, in the County of Middlesex, Esqrs. in consequence of a communication made to them by a certain Foreigner residing abroad, for an Improvement or Improvements in Looms, for making Cloths, Silks, and different kinds of Woollen Stuffs, of various breadths.*

[Sealed 25th March, 1825.]

THESE improvements are applicable only to power-looms, or that construction of loom which is to be actuated by the power of steam or water, instead of manual labour. The novelties introduced into the power-loom, by the present patentees, apply to particular parts of the machine, and therefore a description of the entire construction and operation of a power loom, is not considered to be necessary in this specification, it may however, be seen in several of our preceding volumes, particularly in Bowman's patent, Vol. II, page 161, and plate VII, to which our readers may refer, with advantage, for the better understanding of the following.

The inventions which constitute the subjects of the present patent, have three distinct objects; 1st, the adaptation of certain cam-wheels to the principle rotatory shaft of the machine, for giving the requisite movements to the batten or lay, and reed; 2nd, a cam-wheel or pulley of a peculiar form, also affixed to the main-shaft, for effecting the vibrating motions of the pecker-lever, which, by means of cords, causes the shuttle to be projected to and fro, along the race of the lay; 3rd, other cam-wheels to be attached to the said main shaft, or to an independant shaft, (and then put in motion by a train of toothed-wheels,) for the purpose of acting as tappets or wipers, in order to give the required movements to the headles or harnes, by which the warps are raised and depressed.

Plate I, fig. 4, is a front view of a power-loom, with the improved parts adapted; *a*, *a*, are two pullies, one fastened to its axle, the other sliding loosely round it, as in ordinary power-looms. A band passed from the rotatory part of a steam engine, or any other first mover, over the fixed pulley *a*, puts the machine in action, and which when slidden on to the loose pulley, causes the machine to stop. Upon the axle of *a*, there is a toothed-wheel, that takes into the toothed-wheel *b*, affixed to the main shaft *c*, *c*, which causes the shaft and the several cams to revolve, and consequently, the different evolutions of the loom to be performed; *d*, *d*, is the lay or batten, and *e*, the reed affixed to it. The lay vibrates upon pivots, at the lower parts of its arms *f*, *f*, for the purpose of beating up the webs as usual, which pivots are affixed to the framing of the machine near the bottom.

There are affixed to the main-shaft *c*, two cam-wheels *g*, *g*, which as the shaft revolves, actuates the lay, in the following manner:—There is a stud or pin extending from each of the arms *f*, *f*, of the lay which studs or pins passes into an excentric groove in the face of each of the cam-wheels *g*, and consequently as the cam-wheels revolve, the lay is moved backward and forward upon its pivots. The form of the cam-wheels, and of their grooves will depend upon the kind of fabric intended to be woven, and also whether it is necessary to beat up the weft thread by one or more sharp strokes of the batten or lay, or to press up the weft by a gentle movement of the lay.

A representation of the side or face of one of these cam wheels is exhibited at fig. 5, in which the groove for the stud or pin of the lay to work in, is formed by two concentric curves at the longest diameter, running into the excentric curves in the smaller diameter; this wheel would cause the batten or lay to be stationary, while the stud or traverse pin passed through the concentric groove, and to be brought up gently when the pin passed through the excentric parts of the groove.

Fig. 6, is another form of cam-wheel, in which the curves of the groove, that the pin or stud of the lay is to work in, are so shaped, that the lay or batten would be brought up suddenly, and two sharp strokes given to the lay for beating up the warp.

The form of these cam-wheels, may however be varied, to suit the weaving of different kinds of fabric, in an infinite variety of curves, but sufficient has been shewn to render the principles evident, this part of the invention consisting in the adaptation of cam-wheels to the main shaft of the machine, for the purpose of moving the lay or batten in any way that may be required to effect the weaving of any particular kind of fabric.

The cam-wheel or pulley by which the pecker-lever is actuated, is affixed to the middle of the main shaft *c*, at *h*. This pulley is shewn detached at fig. 7. A pin or stud extending from the back of the pecker-lever *i*, works in the irregular groove of the cam-pulley *h*, and as the shaft *c*, revolves causes the pecker-lever to vibrate upon its pivot by the sudden transposition of the pin, from one side of the pulley to the other, in traversing along the irregular groove. By these means, the cords extending from the end of the lever *i*, are made to pull the peckers *k*, *k*, alternately with a smart sudden jerk, and hence to project the shuttle to and fro along the race in the lay, in front of the reed.

The cam-wheels, sometimes called tappet-wheels, or wipers, which are to move the headles are shewn in fig. 4, at *l*, *l*; they are in this instance affixed to the main-shaft *c*, *c*, and as the shaft revolves, are made alternately to depress one of the levers *m*, *m*, and consequently to work the headles *n*, *n*, which are suspended over the roller *o*, by straps *p*, *p*.

Fig. 8, shews these last mentioned cams, wipers, or tappet-wheels *l*, *l*, as seen side-ways, affixed to the main-shaft *c*. The excentricity of these wheels, must be equal to the required movements of the headles, that is, to the opening or space between the two portions of the warp, when the shuttle is passing between them.

There are friction rollers *q*, *q*, upon the lower levers *r*, *r*, which work against the peripheries of the cam-wheels, and these lower levers *r*, *r*, being attached by cords to the upper lever *m*, *m*, cause the respective headles, to be raised and depressed at stated intervals as the main-shaft revolves.

In order to adapt this loom to the weaving of different kinds of fabric, more than one pair of headles may be occasionally employed, and in that case, more than one pair of cams, wipers, or tappet-wheels; it will therefore be desirable to change the cams or tappet-wheels, without taking the loom to pieces, and for the convenience of so doing, the patentees propose to place the cams upon an auxiliary shaft, to be affixed to the front rail of the frame-work, as at fig. 9, and to actuate them by means of gear or toothed-wheels, connected to a pinion upon the main-axle.

The other parts of the loom are constructed in the way that power-looms are usually made, but as the only novelties proposed are those above described, we need not explain further the operations of the machine, as they will be perfectly understood.

The patentees consider, that the particular advantages of the present improvement, are "1st, the great simplicity of the mechanism, as there is only one cross piece or beam below, upon which every thing works, and one excentric at each end, to move the lay, so that the workman can open the warp and put the shuttle in action when he pleases; 2nd, it is absolutely essential that all the movements of a silk loom should be soft, particularly that of the shuttle, in order that the silk thread, which is on the needle in the shuttle, should unwind itself gradually, and without jerks, and this softness cannot be obtained without giving to the lay a quicker motion in advancing to close the thread, than in returning. In the improved plan the lay moving by means of the excentric or cam-wheel, as described, allows more time for the shuttle to cross the web, than if the movement of the lay was uniform, and consequently the desired object, a soft movement of the shuttle, is obtained; and lastly, the cost of a loom upon this construction, will not exceed two-thirds of the expence of a power-loom upon any other plan heretofore proposed."

[*Inrolled September*, 1825.]

We are favoured with an opinion of the merits of this invention, by Mr. Terneaux, Senr. one of the first manufacturers in France, of which the following translation is an extract:—

"In the first place, the formation of this machine, in comparison with other looms, is perfectly simple, and of very trifling expence to keep it in repair, which is an important consideration for persons about to form establishments; its movements are moreover extremely gentle, which quality renders it equally suitable to the weaving of all kinds of stuffs, either of wool, cotton, silk, and flax; its velocity may be regulated at pleasure, from 60 throws of the shuttle to 120 and upwards, per minute, without the risk of any inconvenience arising from its velocity; the motion of the shuttle is both simple and regular, and is not susceptible of being put out of order, the same may be said of the lay, which is very gentle, and possesses all the advantages so long sought after by mechanics.

"What I found remarkable, and very ingenious in this latter mechanism, is, that you may if you wish it, obtain two different and opposite actions with the excentric wheel, which serves to forward and retrogade the lay, that is, it may be made to retrogade more slowly, and advance more swiftly, in order to give more time to the shuttle to pass through; or it may make it retrogade more swiftly, and make it strike more slowly.

"It may be said, that all the difficulty of weaving is united in the two movements of the lay and shuttle, to which I shall add, that it is impossible, in this latter respect, ever to obtain movements more perfect, or more in harmony one with the other, and less susceptible of derangement.

"These, Sir, are the several observations that I have drawn from the examination of the newly invented weaving loom of M. de Bergues; these observations are moreover founded on results which I have personally witnessed; I cannot therefore but applaud the ingenious author of this invention.

G. S. TERNAUX."

Paris, March 29, 1826.

The original inventor M. de Bergue, has been voted the Gold Medal of the first class, by the Institute of France, for this invention.

To RUDOLPH CABANAL, *of Melina Place, Westminster Road, Lambeth, in the County of Surrey, Engineer, for his Invention of certain Improvements on Engines, or Machinery, for Raising Water, part of which Machinery is applicable to other useful purposes.*

[Sealed 30th March, 1825.]

THIS invention is described as consisting of a "series of moving troughs, or channels, retaining their relative positions to each other, but the inclinations of which are caused to vary or alter by means of any suitable machinery."

The apparatus is mounted upon a pair of curved blocks, upon which it is intended to rock to and fro, and may be in some measure illustrated by supposing a series of spoons placed one above the other, upon this rocking frame; the bowl of the lower spoon being depressed, dips into a pool of water, and as the machine rocks, the bowl rising, causes the water to flow along the handle of the spoon, into the bowl of the next above it, and so on until the water is raised from one spoon to the other, up to the highest receptacle.

Plate II, fig. 1, is a side view of the apparatus; *a, a,* is a level floor upon which the curved blocks *b,* that support the machine are intended to rock; *c,* is a reservoire from whence the water is to be raised by the machine; *d, d,* are the troughs (or spoons as we have taken the liberty of calling them for the sake of simplifying the description) placed in parallel positions one above the other; *e, e,* are similar troughs connected to the sides of the former, and placed parallel, there being one continued water way through the whole series, from the lowest to the highest.

The machine being made to vibrate upon its rockets, by means of any reciprocating mover, the bowl end of the lowest spoon or trough *d*, is depressed into the reservoir *c*, as in the figure, when the water will flow through small valves, opening upwards, into the spoon or trough *d*, to the level shewn by dots. On the machine rolling to the opposite position, so as to tilt the trough the reverse way, the water which occupies the bowl of *d*, will flow along the length of the trough or handle of the spoon, and empty itself into the bowl of the next trough or spoon *e*, above. The succeeding roll of the machine will again depress the spoon *d*, first mentioned, into the reservoir, and cause it to take up another supply of water, while that emptied into *e*, will flow along the trough, and be poured into the second spoon *d*, and so on, the water passing from one vessel to the next above it successively, until it has reached the upper trough, from whence it may be discharged for any purpose required.

This is the construction of the machine, in which any number of troughs may be combined, the two series of troughs crossing each other, and all laying upon the same inclination to the horizon, and parallel on each side; consequently, the water may be raised in this machine to any desired height, by the employment of an adequate moving power.

[*Inrolled September*, 1825.]

To MARK COSNAHAN, *of the Isle of Man, Esq. for his Invention of a new Apparatus for ascertaining the Way and Lee-way of Ships, which apparatus is also applicable to other useful purposes.*

[Sealed 17th March, 1825.]

THIS invention is the adaptation of a weighing machine to the purpose of determining the velocity with which a vessel passes through the water. A drag is immersed in the water, with a float to keep it at a certain depth, and a small line connected to the drag is attached to the weighing apparatus; the force exerted upon the weighing machine by the resistance of the drag in passing through the water, will be exhibited upon a graduated rod in pounds, and these pounds of resisting force, being ascertained to bear a certain relation to the velocity of the ship's progress, in knots or miles per hour, the way of the ship becomes known.

Plate II, fig. 2, represents the apparatus proposed to be employed for ascertaining the ship's way; *a*, is a tube of any convenient form and dimensions, within which a helical or worm spring *b*, is placed, and made to bear against the bottom of the tube, as a resistance; the face of the tube is removed, to shew the parts within; *c*, is a sliding rod, passed through an aperture in the bottom of the tube, the upper end of which rod, is affixed to the top of the helical spring; it will hence be seen, that by drawing out the sliding rod at the bottom of the tube the spring will be compressed, and the mechanical force equal to pounds exerted in so doing, will be shown by the graduated scale upon the rod.

At the upper end of the tube, there is a pulley *d*, which turns upon its pivots, and to the front pivot, a hand or index is affixed, for the purpose of pointing to the graduations upon a circular plate, to be placed at top of the tube as shewn by dots. A cord or chain *e*, *e*, is affixed to and passed round the pulley *d*, and over small guide pullies at the angles of the tube, forming an endless chain, which chain is made fast to the end of the spring at *f*. By this contrivance, whenever the sliding rod *c*, is drawn out, the spring *b*, being compressed, draws the chain down on the side *f*, and by turning the pulley *d*, causes the index to traverse round the plate, and to indicate by reference to the graduations, the force exerted at the lower end of the rod. A spring and click is applied at *g*, taking into a small rack on the side of the sliding rod, for the purpose of steadying the rod, but not exerting sufficient force to prevent its moving in and out of the tube.

This apparatus is to be placed at the stern of the vessel, or at the cabin window, and being there secured, a line attached to the ring *h*, at bottom of the rod, is to be thrown overboard, the other extremity of the line being made fast to a float and drag, as shewn at fig. 3. The drag being immersed at a certain depth in the water, and kept in a vertical position, by the cork float, will, by the progress of the vessel, be drawn along through the water and the resistance or force exerted by the water against the drag, will be shewn by the graduated rod, or by the index of the above described apparatus in pounds; and by another graduated scale, at the back of the rod, the rate of the vessel's progress, or the number of knots per hour will be exhibited; the force of resistance increasing as the velocity of the vessel increases, and the scale of knots or miles being graduated in due proportion to that of pounds on the other side.

To determine the lee-way of a vessel, or the amount of her drifting, in an oblique direction to her course, by the latteral pressure of the wind, the apparatus shewn at fig. 4, is devised. It is made in the shape of a semi-circular box *a*, having a graduated plate with an index, and a spring within, which keeps the index over the middle of the plate. The box being secured to the cabin-window a line is attached to the index, which is secured at the reverse end, to the drag before described, and as the vessel proceeds, the inclination of the index, either to the right or left of the perpendicular, which represents the central line of the ship, will shew the amount of lee-way to be calculated into the ship's course.

The patentee proposes to employ the apparatus first described as a weighing machine, but a contrivance very like this, has been in existence for many years; and employed as a weighing machine.

[*Inrolled September,* 1825.]

To William Gillman, *of Whitechapel Road, in the County of Middlesex, Engineer, and* James William Sowerby, *of Birchin Lane, in the City of London, Merchant, for their Invention of certain Improvements in Generating Steam, and on Engines to be worked by Steam, or other Elastic Fluids.*

[Sealed 13th April, 1825.]

The principle feature of improvement proposed under this patent is a method of increasing the production of steam, in the boiler of a steam-engine. Plate II, fig. 5, is a section of the furnace, shewing the tubes within; *a*, is the fire-place; *b*, one of a series of cylindrical close vessels, made of cast iron, and lined with copper, to prevent oxydation. Several of these vessels are proposed to be placed side by side immediately over the fire, and within them the steam is to be generated; *c*, *c*, *c*, *c*, are four ranges of small tubes, also placed side by side, and forming partitions in the flue, which tubes are to be kept filled with water, and heated by the flame, smoke, and vapour, emanating from the fire. There are also several ranges of similar tubes, placed round the sides of the fire and communicating with the former. These tubes are connected to each other, in the manner shewn at fig. 6, by which a way for the passage of water is made entirely through the whole system of small tubes, and the ends of them are made to take off, for the purpose of occasionally cleaning the interior from fur or incrustation.

A reservoir of water is placed at some convenient distance from the furnace, from whence a pipe is carried to a force pump, which injects the water into the upper range of small tubes.

From these small tubes, the water, when heated, is injected, by another force pump, into the boilers *b*, which force pump acts simultaneously with the former; hence, every time that a jet of water is thrown into the boiler or generator *b*, by a stroke of the pump, a corresponding quantity of water is forced into the smaller tubes *c*, *c*.

The pipe *e*, conducts the heated water from the small tubes *c*, into the larger vessel *b*, and in order to facilitate the generating of the steam within, the water as it enters the tube, is circulated or distributed about the interior of the vessel, by a revolving agitator, shewn by dots, the flaps or arms of which, are set obliquely to the axle, and this distribution of the water over the interior of the vessel, will be assisted by placing the vessel itself a little inclining from the horizontal.

It is proposed under some circumstances, to place within the tube *b*, a cylinder perforated with small holes, into which the water is to be received, and this cylinder being made to revolve, the water will, by its centrifugal force, be thrown in small jets over the internal surface of the heated tube, and the steam be rapidly produced.

The rotation of the agitators, is caused by a transverse shaft, carrying bevelled pinions, which take into bevel-wheels, affixed to the ends of the agitators, as at *f*, which shaft is proposed to be actuated by the rotatory part of the engine. The steam may be conducted from the generators to a steam chamber, at any convenient distance, or it may be made to communicate immediately, with the induction valve of a steam engine.

It is proposed to increase the effect of the furnace, by mixing inflammable materials with the coal, wood, or other fuel, either before the fuel is put into the furnace, or by scattering or sprinkling tar, pitch, or any other inflammable material over the fire while the steam is rising.

As the steam to be produced in this improved apparatus will be of that elastic force called high pressure, it is proposed after employing it for driving the piston of one engine, to allow the steam to pass without condensation into another engine, which may be calculated to be worked by steam at a less pressure.

The different parts of the apparatus may be disposed and modified in a variety of ways, upon the principles above described, all of which are considered within the meaning of the patent right: the particular features of novelty claimed by the patentee, being embraced under the six general heads following:—" 1st, Spreading the sheets of water over the interior of the generator or boiler, by means of a revolving agitator or a revolving tube, perforated with holes. 2ndly, Placing a system of tubes, filled with water, round the fire and in the flues, for the purpose of heating the water before it is injected into the generator. 3rdly, The mode of connecting these last mentioned tubes together. 4thly, The attachment of force pumps to the apparatus, by means of which the strength of the tubes can be at any time proved. 5thly, The application of tar, pitch, or any other combustible material, by mixing with or sprinkling over the fuel, for the purpose of increasing the intensity of the fire. 6thly, Employing high pressure steam to work the pistons of two or more engines in succession, without condensing."

The inconsistency of these claims to novelty of invention must be obvious to every one who has perused the contents of our foregoing volumes.

[*Inrolled October,* 1825.]

To Richard Witty, *of the Town of Kingston upon Hull in the County of the same Town, and of Sculcoats, in the County of York, Civil-Engineer, for his new Invented Improvement in the Method of Lighting by Gas, by reducing the expence thereof.*

[Sealed 25th March, 1825.]

This invention is simply a glass chimney, of a particular form, to be placed over the flame of a gas burner. It is to be made cylindrical at the lower part, for about half way up, and then conical to the top, which is to be contracted in its diameter about three quarters of an inch less than the base, supposing the height of the glass chimney to be about eight inches.

By the employment of this form of chimney, the flame of the gas is said to give out a very superior light, and consequently, to economize the consumption of gas, which constitutes the whole matter of the "new invented improvement in the method of lighting by gas, by reducing the expence thereof," for which the above patent is granted.

[*Inrolled September*, 1825.]

To THOMAS PYKE, *of Broadway, near Ilminster, in the County of Somerset, Dissenting Minister, for his Invention of a Machine or Apparatus to Prevent the Overturning or Falling of Carriages.*

[Sealed 14th May, 1825.]

THIS invention is a repetition of the old plan, which has been so often proposed before, of a swinging prop, intended to fall from the side of the carriage outwards, and to act as a crutch in the event of the carriage turning over on one side.

The apparatus which is represented in the specification by a very rude sketch, seen in Plate II, at fig. 7, consists of a leg or crutch *a*, attached to the side of the carriage by a hinge joint *b*. The crutch is strengthened by bows on each side near the top, and a friction-roller *c*, at bottom; *d*, is an arm at the back, for the purpose of giving stability, which is affixed to the frame-work *e*. The hinge-plate *f*, has a rebate in front, to limit the extent to which the crutch shall fall outwards, and is attached to a bar *g*, which passes under the body of the carriage, for the purpose of affixing a similar apparatus on the reverse side, by which contrivance whenever the carriage tilts over, the leg or crutch immediately falls outwards, and becomes a prop, upon which the body of the carriage rests, or even is enabled to run forward.

The contrivance shewn is designed to be applied to a four-wheeled carriage, or by a slight variation in the back framing, to a gig or other vehicle, running upon two wheels. The construction of the framing we do not exactly understand, but sufficient is shewn to make the principle feature evident.

[*Inrolled July*, 1825.]

See Hirst, Heycock, and Wilkinson's Patent, Vol. XI, page 234, and Plate XII.

To William Booth, *of Congleton, in the County of Chester, Gentleman, and* Michael Bailey, *of Congleton, aforesaid, Mechanist, for their Invention of certain Improvements in Spinning, Doubling, Throwing, and Twisting Silk, Wool, Cotton, Flax, Hemp, and such like materials.*

[Sealed 13th January, 1825.]

The patentees have described in their specification, a number of parts and appendages to a spinning, doubling, throwing, and twisting apparatus, in terms which, we presume, are technical in the neighbbourhood that they reside in; they have also exhibited several figures, very rudely sketched, intended we suppose to shew the said improvements, and have referred to these figures in their description, by letters and numbers of reference, which however are mostly omitted in the drawing. There is no definite statement of the objects of these improvements, or as far as we can discover, of the methods of putting them into operation. We have perused the specification again and again, but neither from the written description, or from the accompanying drawing, or from our own knowledge of such kind of machinery, have we been able to collect a single idea either of the nature, or the intention of the matters comprehended under the patent.

This is, unequivocally, one of the most obscure specifications we ever read. The fault principally consists in the excessive rudeness and inaccuracy of the sketched figures, but even these might have furnished some clue to the matters said to have been invented, had not the patentees been so extremely careless as to have omitted nearly all the letters of reference.

Having said thus much, our readers will see our total inability to lay before them the merits, or even the intentions of the patentees, we can therefore only say that this specification was

[*Inrolled, July*, 1825.]

We beg to remark, that if the Patentees should (upon these remarks meeting their observation) feel disposed to furnish us with a concise statement of their intentions in the above specification, that we shall fell very happy to correct the above report.—EDITOR.

To John Biddle, *of the Parish of Donnington, in the County of Salop, Glass Manufacturer, for his new Invented Machine, or Combination of Machinery, for Making, Repairing, and Cleansing, Roads and Paths: which Machine, or parts of which Machinery is, or are, applicable to these and other useful purposes.*

[Sealed 8th July, 1825.]

The machine herein proposed, consists of three cylindrical rollers, mounted upon axles, in a frame, to be drawn by one or more horses. The rollers are placed obliquely, side by side, but running in parallel positions; their axes receding a little behind each other. These rollers are intended to pass over the surface of the road, for the purpose of pressing the broken stones, gravel, and other materials, close together, so as to produce a solid or compact road with a smooth surface. In the front of the rollers a long scraper is placed, crossing the frame obliquely, for the purpose of collecting up, and conducting away the mud, and slush, to the side of the road; and at the back part of the apparatus, there is a perforated cylinder, intended to take up the softer, or muddy parts of the road, and deposit it in a swinging box within.

Plate II. fig. 8, is a view of the machine, or apparatus, as seen on the top; *a, a, a,* are the the three cylinders for pressing the loose stones of the road together. As the apparatus is drawn along, these cylinders revolve upon their axles, which are mounted in the frame *b, b, b.* There is a small guide roller, or wheel c, in front of the frame, to which the shafts are attached, and by which the apparatus may be turned round or guided in a curved course; *d, d,* is a thin plate of iron, placed obliquely across the machine, in front of the rollers. It is attached to the framing by rods and screws, and is thereby made adjustable to any height, so as to scrape the surface of the road evenly. The foremost end of the scraper is curved, for the purpose of preventing the escape of the mud, which, being collected as the machine advances, runs along the inclined surface of the scraper, and is conducted to the side of the road. Thus the mud is proposed to be scraped off the surface as the apparatus advances, and the materials of the road compressed and hardened, by the traversing of the rollers. It may be added, that in order to increase the pressure of the rollers, a box, to be affixed to the frame work, is proposed to be placed over the rollers, which may carry stones, or other heavy materials, that might be used in making or repairing of the road.

Under some circumstances, the patentee proposes to adapt to the apparatus, the auxiliary cylinder *e*, which is made to revolve upon its axle as it rolls along the road, and is attached to the former by a frame *f*, *f*. This cylinder *e*, is perforated all over its surface with holes, or slots; and when it passes along the road, the mud, which is conducted to it by the scraper, *g*, *g*, presses through these holes, or slots, to the interior.

Fig. 9, is a side view of this cylindrical roller *e*, attached to the frame *f*. Within this cylindrical roller, the box *h*, is suspended, swinging upon pivots; and as the roller goes round, the brush *i*, removes the mud from the cylinder, and causes it to fall into the box below. When the box is filled with mud, it may be discharged through the door *k*.

[*Inrolled January*, 1826.]

Novel Inventions.

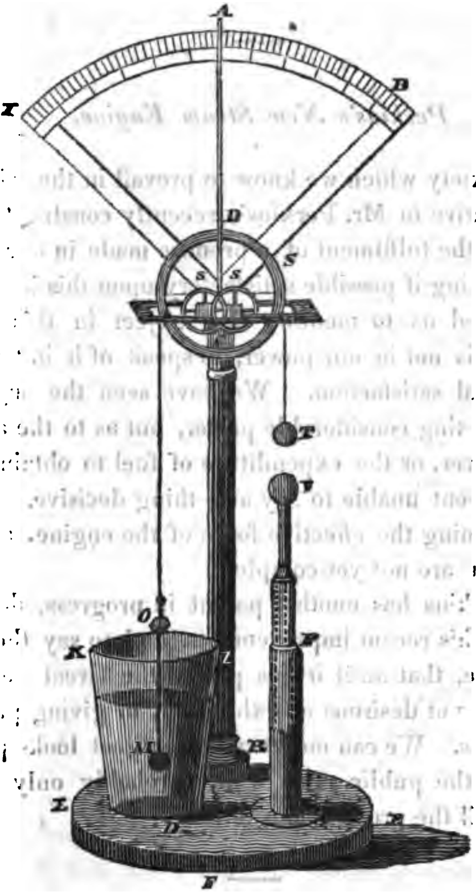
Perkins's New Steam Engine.

The anxiety which we know to prevail in the scientific world relative to Mr. Perkins's recently constructed engine, and the fulfilment of a promise made in our last to say something if possible satisfactory upon this invention, has induced us to mention the subject in this place, though it is not in our power, to speak of it in terms of unequivocal satisfaction. We have seen the engine at work, exerting considerable power, but as to the amount of that power, or the expenditure of fuel to obtain it, we are at present unable to say any thing decisive. Means of determining the effective force of the engine, are preparing, but are not yet complete.

Mr. Perkins has another patent in progress, designed to protect his recent improvements, and to say the truth, we believe, that until it has passed the Great Seal, Mr. Perkins is not desirous of exhibiting, or giving publicity to his plans. We can only say the subject looks promising, and the public must wait, (probably only a few days,) until the proof comes forth.

Electrical Balance.

We are this month enabled to furnish our readers with an illustrative sketch of a very ingenious apparatus, contrived by Lieut. Harris. Its action depends on balancing the attractive force of accumulated electricity, by the increased weight which a body immersed in a fluid gains on rising out of it. It consists of a stand R, B, L, F; on this



is screwed a perpendicular column R V; it supports a projecting part of brass Z, to sustain a large wheel D; the axle of this wheel rests on four small friction wheels s, s, and its centre is that of the arc B, I; this arc is a quadrant, divided into any number of equal parts on each side of its centre, marked Zero; the large wheel D, carries an index, formed of a fine strong straw, to indicate the attractive forces in the direction A, B, and the repulsive in the direction A, I; over the wheel passes a line S, to which is suspended a light ball of gilt wood T. The float sustained, in great part, by the fluid in the vessel K, preserves an equilibrium when the index is at Zero; the line passing over the pulley, if the attractive forces are to be estimated, is formed of two parts, the lower part being of silver thread, the remainder silk. When the repulsive forces are to be estimated, the whole is of silk. The float O, M, is a small glass tube, about two tenths of an inch diameter, terminating in a small bulb at its lower end, which contains some very fine shot, or mercury, occasionally put into it for the purpose of adjusting the instrument. The fluid is distilled water of a mean temperature. The difference of weight of this float, when in and out of the water is known, and every tenth of an inch of it, which rises out or sinks into the fluid, is made to correspond, by employing a wheel of the required circumference, with five divisions of the arc above; we can hence readily estimate the force of the attraction in grains, and parts of a grain. Under the ball T, is placed a larger insulated ball V, in connection with the prime conductor, or inner coating of the jar; it can be depressed, or elevated, by means of the sliding tube P, through divisions of one-tenth of an inch, which correspond, also, to every five divisions on this arc; and this enables us to obtain any multiple of the first force, and yet preserve the ultimate distance between the balls constant. Now it is evident, that the attractive or repulsive forces, operating in right lines between the balls, will cause the float to ascend or descend, until the weight gained or lost by its rising or sinking in the fluid, furnishes a balance to the forces. The column is of baked wood, and has a wire through it, which, when the attractive force is alone measured, is connected at the base with the outside of the jar, or battery; and hence the interval between the inner and outer coating, is that between the balls T and V; so that, when charging, the attraction between the balls will increase with the accumulation; hence the index moving over the arc I, N, is a true measure of it. It may be proper to state, that the above apparatus was employed by Mr. Partington in his Lectures at the London Institution.

On Neutralizing the Magnetism of Watches, and other Time Keepers. by MR. ABRAHAM, *of Sheffield.*

"IT is, I believe generally understood by those who have not made the science of magnetism a study, that the fluid is *communicated* to steel bars, and other articles capable of possessing permanent active magnetism, by induction, friction with magnetic bars, &c. &c.

In my opinion the very contrary is the fact. All ferruginous bodies possess the magnetic fluid in a latent or inactive state, in proportion to their purity; this fluid may be brought into action and concentrated by various means as position, friction, percussion, attraction, galvanism, electricity, &c. I believe that attraction is the most general cause of the steel works in time pieces becoming actively magnetical.

Valuable watches are frequently observed to keep very irregular time, from no visible cause, while the works remain in connexion; nor after they are separated, unless the steel works are tested, by plunging them into fine steel filings. From the minuteness and delicacy of those parts of a time-piece which are manufactured from steel, it has been considered by those watch-makers with whom

I have conversed on the subject, to be almost an impossibility to deprive them of active magnetism by any other means than that of heat.

When a balance or verge has been exposed to a sufficient heat to distribute the fluid, it becomes unfit for further use till hardened and polished, and even then it is frequently spoiled; therefore watch-makers prefer either returning the watch in its magnetic state, or supplying new apparatus, which generally incurs an expense of six or seven shillings in a common watch, and a greater sum in proportion to the value of the works. In attempting to *distribute* (or, according to the general term *take out*) the magnetism in any part of the steel works of a watch, with a *very fine magnet* by *touching* it in a contrary direction, or with a different polarity, it must be complete chance if the experiment succeeds; since the power applied, and the delicacy of the *touch*, must be in proportion to the activity of the magnetism, and the fineness of the part containing it; for wherever the *finest* magnet last touches any part of a balance, it will leave a small concentration of magnetic power.

With a series of fine and very delicate magnets I always failed in *completely* neutralizing the fluid by the touch. After spending much time without success, I was still determined to surmount the difficulty if possible. Upon studying the first cause of all my trouble and disappointment, I was led to believe that I very probably might destroy the effect by means similar to those which produced it, and in this I was not disappointed, for the experiment succeeded equal to my expectations. Time-pieces generally become actively magnetical without being brought into contact with the agent that concentrates the fluid; but, according to the laws of magnetism, a contrary polarity will always be found in the part rendered magnetical, to that of the magnet presented to it.

This proves that the fluid is put in motion and concentrated by *attraction;* present the contrary power in the agent (not in contact) to the same part of the machinery, and it will repel or re-distribute the fluid which was previously attracted, and if it be kept in that position the least period of time beyond that which is necessary to to neutralize the fluid, it will give contrary polarity to the part subjected to the experiment.

For some time I found a little difficulty in performing the experiment satisfactorily, owing to the invisibility of the fluid; but I was relieved from this difficulty by dipping the apparatus to be experimented upon into fine steel filings, which rendered the situation of the active magnetism visible.

Upon presenting a fine magnet to the part clothed with filings, at the distance of from one inch to one quarter of an inch, according to the power to be neutralized, it will immediately be perceived whether the polarity of the magnet be of the same kind as that in the apparatus: if so, the filings will gradually fall from the part as the power becomes neutralized; when all the filings have fallen from the part submitted to experiment, dip it again into the filings, to prove whether it has acquired opposite polarity, by remaining too long in the vicinity of the magnet; if that be the case, present the contrary end of the magnet at a distance in proportion to the power to be diffused. Very little practice will enable any person to deprive any part of the steel apparatus belonging to the time-piece of active magnetism in two or three minutes. I can generally perform the experiment in one minute, however magnetical the balance or other part may be that is to be deprived of this concentrated power."

[For this invention the Society of Arts have voted Mr. Abraham their large Silver Medal.]

On a new method of producing Landscapes, &c. by means of Black-lead dust, by Mr. Galpin, *of Charmouth.*

"Having, in common with, I believe, all admirers of drawing in black-lead pencil, long regretted that a material of such a natural and pleasing neutral colour should be confined to the tedious process of producing broad gradations of shade, by means of a laborious repetition of lines or touches, I commenced about two years ago a series of experiments, with a view of producing a breadth of touch and effect equal to oil painting, supposing it to be executed in a neutral tint corresponding with the colour of black-lead; but I found, after indefatigable labour, that the granular separation of that material, when applied to paper, rendered it impossible, although I remained satisfied that it would be superior to any other material for the general purposes of drawing if this impediment could be removed; and about two months ago, considering I had only heretofore applied the material in its natural state, I resumed the pursuit, by reducing it to an impalpable powder, and using it with a brush, palette, &c., and the result has been the most complete success, by a process exceedingly easy and simple, by which every possible degree of shade can be produced with the nicest uniformity of tint, when necessary, and in less than a twentieth part of the time required in the ordinary manner, with an apparatus which does not exceed the cost of one shilling, consisting of a small piece of fine muslin, filled with dark black-lead, reduced to fine powder (and tied up similar to bladder colours used by artists), which I have called a *shader*; a *palette*, made of thick card-board; and a *brush* (such as is used by artists in oil) of medium size.

Process.—The shader is rubbed two or three times on the palette, near one extremity, by which a small portion of the lead is sifted as it were through the muslin; the brush is passed round in the pulverized lead, and on some other part of the palette, to adjust the shade required; the brush is then applied to the paper, to produce a sky or other expanse of shade, with a circulating motion. A sky which before this invention has taken me six or eight hours, I now execute in as many minutes.

The sea is produced by the pith of the common elder, the wood of which is cut away so as to expose the pith to the touch, which on being applied to the palette, and then to the paper, produces a beautifully soft and gradual touch.

From the beautifully uniform tint produced by the brush and pulverized lead, I was led to try the possibility of applying it to useful ornamental purposes, by means of the process of stencilling.

The figures or patterns are cut out in thin card; one of these being laid on the paper, the brush, previously charged with black-lead, is passed over it with a circular motion, and an impression, or rather copy of the figure is the effect. Complicated ornaments may be produced by the successive application of two or more figures on the same ground, or by moving the pattern a little, and then producing a second copy, which will mingle with and modify the first. Both these methods even might be combined, if a very complicated figure, difficult of imitation, was wanted.

I beg particularly to remark that my principle of producing skies can be adopted by any artist without interfering with their general style of drawing, and is so exceedingly easy, that a novice cannot fail of producing a tolerable effect. I have received several applications from amateurs (who have presumed I used Indian ink), to ascertain how I produced my skies so rapidly, but I have not yet communicated my process to any individual, from the hope that the Society of Arts will consider my invention an acquisition to the arts, and give it a place in their volume of Transactions, and I beg leave to add; that it would be highly gratifying to my feelings, to have it first made public through so distinguished a source; and I shall feel happy to give the Society any further information on the subject.

P. S. I think I omitted to mention, that the common black-lead is ground in water on a stone, in the manner of ordinary paint, and dried before the fire or in an oven, and again reduced to powder in a mortar, then tied up in muslin as described in my first communication; in the space of ten minutes a sufficient quantity may be prepared to supply the constant application of three months.

The materials used by me in executing drawings in black-lead are three brushes, made of badgers' hair, similar to those used by painters in oil-colours, and denominated softeners, except being only one third of the length of ordinary softeners in the hair; the largest brush is one inch in diameter, the second three-eighths, and the smallest one-eighth of an inch in diameter. A palette of ordinary size, made of thick card paper. The pith of common elder tree, dried naturally; and two small muslin bags, filled with pulverized black-lead."

[For this invention the Society of Arts have voted Mr. Galpin their Silver Isis Medal.]

FRANKLIN INSTITUTE.

Committee of Inventions, September 4, 1826.

Auger for Boring Square Holes.

THE Committee of Inventions having had referred to them for examination, an auger for boring holes, either square, or of any other desired form, invented by Mr. H. Branch, of the state of New York, and for which he has obtained a patent from the United States, report,

"That they have carefully examined theins trument, and that it consists of an auger, formed like the ordinary American screw-auger; that the twisted part of the auger is enclosed in a case or socket, extending from the upper part of the twist, to the cutting-edge; allowing the small entering screw only to project beyond it. The external form of the socket is either square or otherwise, according to the intended shape of the hole to be bored, a large portion of its sides being cut away, to allow the chips to escape. The lower end of the socket is of steel, with a sharp cutting edge, bevelled towards the inside. The cutting-edges are not allowed to terminate in right lines, but are made concave, so as to admit the angular points to enter the wood first; this causing it to cut with greater ease, and more smoothly than it otherwise would.

The upper part of the socket forms a collar, which works freely on the shank of the auger, just above the twisted part, and is retained in its place by a pin, and other appendages.

When a longitudinal hole, or mortice, is wanted, two or more augers are placed side by side, furnished with their appropriate sockets, and retained in their places by obvious contrivances.

But few instruments have fallen under the observation of the committee, so competlely adapted to the attainment of its object; it is at once perfectly simple in its construction, and efficient in operation, boring a square hole, with well defined angles, with nearly the same rapidity, as a round one of the same diameter, and forming it with a degree of truth unattainable by the ordinary methods.

The committee have never seen described, or in use, any instrument upon the same principle, or which can in any way interfere with it, as an original invention."

By order,

THOMAS P. JONES, *Sec.*

Mr. DOUGLAS FOX, *of Derby, on a Mode of making Elastic Moulds of Glue.*

"HAVING been much employed in taking casts of anatomical preparations, I frequently met with specimens, principally of hard substances, that did not admit of moulds hitherto employed being removed from them. This arose from any given specimen of such description having various portions of it with considerable overlaps; that is, there were hollows, or undercut parts, from which no mould could be withdrawn without its being injured.

Although in many instances soft clay, or soft wax, may be used to take impressions, still these, in numberless instances, cannot be removed from the body to be moulded, without being injured in those parts which were pressed into the hollows; to overcome these difficulties, it appeared evident that if an elastic substance could be substituted for the soft clay, or wax, the moulds might be withdrawn uninjured, by giving way during the removal from the undercut parts of any such body, and also that the moulds would afterwards return to their proper forms again. To effect this I have made use of glue, which has answered perfectly, employed as follows:—

The body to be moulded, previously oiled, must be secured one inch above the surface of a board, and then surrounded by a wall of clay, about an inch distant from its sides, the clay must also extend rather higher than the contained body: into this, warm melted glue, as thick as possible, so that it will run, is to be poured, so as to completely cover the body to be moulded; the glue is to remain till cold, when it will have set into an elastic mass, just such as is required.

Having removed the clay, the glue is to be cut into as many pieces as may be necessary for its removal, either by a sharp pointed knife, or by having placed threads in the requisite situations on the body to be moulded, which may be drawn away when the glue is set, so as to cut it in any way that may be desired; the use of these threads need not be more fully explained, as the method is generally known to persons in the habit of casting.

The portions of the glue mould having been removed from the original, are to be placed together, and bound round by tape.

In some instances it is well to run small wood pegs through the portions of glue, so as to keep them exactly in their proper positions. If the mould is of considerable size, it is better to let it be bound with moderate tightness upon a board, to prevent it bending whilst in use; having done as above described, the plaster of Paris, as in common casting, is to be poured into the mould and left to set.

In many instances wax may also be cast into glue, if it is not poured in whilst too hot, as the wax cools so rapidly when applied to the cold glue, that the sharpness of the impression is not injured.

I have stated glue as succeeding well where an elastic mould is alone applicable; but many modifications are admissible. Where the moulds are not used soon after being made, treacle should be previously mixed with the glue (as employed by printers), to prevent it becoming hard.

The description thus given is with reference to moulding those bodies which cannot be so done by any other than an elastic mould: but glue moulds will be found greatly to facilitate casting in many departments, as a mould may frequently be taken by this method in two or three pieces, which would on any other principle require many.

DOUGLAS FOX."

[The Society of Arts have voted to Mr. Fox their large silver medal for this invention.]

New Scale and Protracter, Invented by MR. TWITCHELL, *of Philadelphia.*

THIS instrument consists of a circle, marked with lines of sines, tangents, secants, semitangents, and chords; to the centre of which circle is annexed a scale, of the shape of half a cross, agreeing with the line of chords on the circle, and marked on each limb with the line of equal parts. The cross limb of this scale consists of two parts, to one of which is annexed a semicircle, marked with the line of chords, the other part turning on its centre, and agreeing with the line of chords on the semicircle, serving both as a protracter and scale. To the centre of the whole circle, is annexed a small limb, agreeing with the line of chords on the circle, and extending over the scale, and serving as a secant to the circle. This scale exhibits the use of chords, sines, secants, and tangents, and the mode of applying them to angles, giving the sides and chords of any triangle; and also its sine, tangent, and secant; and likewise latitude, departure, course, and distance. For drafting, this scale is particularly useful; for in plotting nothing more is required, than to turn the scale to the course, and mark the distance.—*Franklin Journal.*

New and cheap Menstruum for Biting in Etchings on Plates of Steel; for which the Societg of Arts have voted their Gold Isis Medal to Mr. HUMPHRYS, *of Charlotte Street, Rathbone Place.*

THE composition of the menstruum is as follows:—

Take a quarter of an ounce of corrosive sublimate powdered, and a quarter of an ounce of alum powdered, and dissolve them in half a pint of hot water.

Directions.—Let it cool before use. While using it keep it stirring with a camel's hair brush, and take care to wash the plate perfectly after each biting. As this acid, though clear before use, becomes turbid during its action on the steel, it may be prudent, in fine works, to throw away each portion of acid after it has been on the plate. The taste and experience of the artist must dictate the length of time he may leave it on his plate; delicate tints are obtained in about three minutes.

It appears from the experience of those artists who have practised engraving on steel, that several of the menstrua employed in the process technically called biting-in, will succeed with hard steel, but give results by no means so satisfactory when employed on very soft, or nearly decarbonized steel. Nitric acid is the essentially active ingredient in all these menstrua; and the chemist well knows, that when this substance is brought in contact with iron, it usually brings part of it to the state of protoxid, which is soluble in the acid, and also reduces a smaller portion to the state of peroxid, which remains, for the most part, undissolved, adhering to the surface of the iron, and thus preventing that deep, clean, uniform biting, which it is the great object of the artist to obtain. The presence of carbon, in a finely divided state, has a tendency to prevent, or at least to retard, the peroxidation of the iron; and this, probably, is the reason why it is less difficult to gain a good result with hard, than with soft or decarbonized steel.

The composition employed by Mr. Humphrys contains no nitric acid; and from the testimony before the Committee, of Mr. W. Finden, Mr. Warren, Mr. Romney, and others who have tried it; and also from the result of experiments made in presence of the Committee, appears to be superior for biting-in on soft steel, to any menstruum that has hitherto been used.

Polytechnic and Scientific Intelligence.

ASTRONOMICAL SOCIETY OF LONDON.

February 9, 1827.

Report of the Council of the Society to the seventh Annual General Meeting this Day.

SEVEN years have now elapsed since the formation of this Society; during which period, it must be evident to every intelligent observer, that a considerable progress (assisted, it is hoped, by the exertions of this Society) has been made in the science of Astronomy, not only in our own, but in every other country. The increased number of observatories, and the consequent encouragement which is given to the improvement of astronomical instruments:—the zeal and assiduity, not only of the public observers, but also of many private individuals, who nobly sacrifice a great portion of their time and fortune to this laudable pursuit,—prove that the science is now more generally followed and encouraged that at any former period.

To enable the Society to continue their assistance in preserving and promoting this favourable change, the Council rely on the cordial co-operation of all those members who have the means, in their power, of conducing to this grand end. Those even, who have only *small* instruments in their possession, may still do much good, by a careful and judicious use of them; for although every astronomer must admire the vast field that has been opened by the powerful and splendid telescopes of Messrs. Herschel, South, and Struve, and the patience and skilful assiduity of these observers, yet we ought not to lose sight of those innumerable aids which may be rendered to astronomy, by more humble instruments; nor of the assistance that may be afforded to the *physical* and other departments of the science, by those who are not possessed of any instrument at all.

In the last report of the Council it was stated, that a letter had been received from M. Bessel, relative to a plan for a general survey of the heavens, and for making detached Charts of the same. The *prospectus* relative to this subject was translated and distributed, not only amongst the members of this Society, but also amongst such other astronomers, as might be supposed desirous of encouraging so useful and important an undertaking. Two applications were made from this country, to the Committee at Berlin, appointed to superintend the distribution of the allotments; but, it is doubtful whether more than *one* of them can be appropriated here, as it is understood that the rest have been, or probably will be, taken up by different astronomers on the continent.

The Council regret that all the various prize questions, that have from time to time been proposed by the Society, still remain unanswered; the period having expired for the determination of the whole of them; except that which relates to the moon's place, which will not terminate till Feb. 1st, in the ensuing year. How far it may be expedient to renew them, or to substitute others, will depend on the views entertained on this subject, by their successors in office.

The new Tables for computing the Aberration, Precession, and Nutation of 2881 principal fixed stars, together with a catalogue of the same, are now completed, and have been some time in the hands of the public. This important work was first suggested and the formulæ for the computations were investigated and practically arranged by F. Baily, Esq. your indefatigable President who, agreeably to the regulations of the Society, resigns the chair this day. Much of the time and labour of the computers, engaged in this extensive work, was saved, and the liability to error very much abridged, by the use of printed *skeleton forms*, which he had constructed expressly for their use from formulæ reduced to the most simple and convenient shape for calculation.

The work itself has been brought to a successful termination by the extraordinary diligence, activity and perseveranee of Lieut. Stratford, of the Royal Navy, one of your Secretaries; who, in the midst of his other various avocations and duties, has been unremitting in his attention to promote the progress and secure the accuracy of this highly useful work; and who is entitled to your best and most cordial thanks for such a devotion of his time and labour. In fact, the Council, desirous of expressing their sense of the benefit conferred on the science of Astronomy by this important undertaking, have awarded the gold medal to Mr. Baily; and the silver medal to Lieut. Stratford, for the service rendered by these gentlemen in the promotion and completion of the work. May we hope that some experienced astronomer will now take up this new catalogue, and make a series of observations on *every* star contained therein, whereby we may be enabled to ascertain more correctly the proper motion (if any) that should be attributed to each star; and thus deduce a *Fundamental Catalogue* that may assist astronomers for many years to come. The expense of computing and printing this Catalogue has encroached on the ordinary funds of the Society; and has induced many members to suggest the propriety and advantage of defraying the expense not only of this, but of any similar undertaking, by means of a separate subscription amongst the members. Should a measure of this kind be recommended, the Council trust that it will meet with the support of every friend of science.

The Council, bearing in mind the objects which it is the wish and desire of the Society more particularly to promote, have also awarded the silver medal to Col. Beaufoy for his valuable collection of observations communicated from time to time to this Society, and more especially those relative to the Eclipses of Jupiter's Satellites. Part of this collection has already been published in the Memoirs of this Society; and the remainder will appear in the ensuing volume. These observations seem to have been made with great care and diligence, and afford another and a powerful instance how much the science of astronomy may be benefited by the active exertions of *one* individual. Phænomena of this kind cannot always be observed at the *public* observatories; the state of the weather, or more important avocations, may oftentimes interfere to prevent it. It is in such cases, and in numerous other instances, that *private* observers may render an important benefit to the science by their active co-operations.

These several medals to Mr. Baily, Lieut. Stratford, and Col. Beaufoy* will be presented at a subsequent general Meeting of the Society to be convened for that express purpose.

The past year has been abundant in the discovery of Comets; no less than five having been announced at the last meeting of the Society. One of these was discovered by M. Gambart, the celebrated astronomer at Marseilles; who, on computing its elements, found that, in all probability, it would pass over the sun's disc on the morning of the 18th of November. He immediately adopted measures for communicating the result of his calculations to all the astronomers in Europe, in order that they might witness this remarkable appearance. But, unfortunately, the whole of that day was cloudy; and it does not appear that this singular phænomenon was witnessed by any human being. To M. Gambart we are also indebted as one of the discoverers of another comet, which appeared in the month of March; and which has since been found to be *periodical.* This comet had been previously seen by M. Biela at Josephstadt; and M. Clausen, on computing its elements, ascertained that it was the same as that which was seen in 1772 and again in 1805. It is remarkable that both M. Biela and M. Gambart had, in the mean time, come to the same conclusion, from the elements deduced from their own separate and independent observations; thus confirming the addition of another revolving comet to our system, whose period is about 2461 days, or about twice the period of the celebrated comet of Encke. This new planetary body will make its appearance again about the latter end of the year 1832; and the attention of astronomers will then be naturally directed towards its return. If the comet of 1786 bear the name of Encke, this new revolving comet ought, for a similar reason, to bear the name of that astronomer who may most effectually succeed in investigating the laws by which it is governed. It is but a just tribute of respect to men who, by their assiduity and talent thus enlarge the bounds of science, and add to that vast mass of facts which are absolutely necessary to enable us to judge of the true system of the universe.

In the last part of the memoirs of this Society, is a report from the Committee appointed to examine the telescope, whose object-glass was formed of the glass presented to the Society by the late M. Guinard. The object-glass being finished and approved by the Committee (whose report will be seen in the last volume of the Memoirs) it was thought advisable that it should be offered for sale to any of the members of the Society that might be disposed to bid for it; and that the proceeds after the payment of expenses for working the glass, should be transmitted to the family of M. Guinand, for their use and benefit. This has been done: and the object-glass is now in the possession of the Rev. Dr. Pearson, the Treasurer of this Society.

With respect to the finances of the Society, it will appear from the report of the Auditors, which has been read, that there have been elected 11 new members, and 3 Associates since the last anniversary: and that the Society now consists of 212 Members and 32 Associates:—in all, 244. At the same time it will be seen that considerable expensee have been incurred in printing the last volume of the Memoirs; which however, contains a considerable quantity of matter that must be interesting both to the theoretical and practical astronomer.

Amongst the losses by death, which the Society has sustained in the year just passed, the Council have to regret those of three of its distinguished Associates: M.M. Bode, Fraunhofer, and Piazzi. The former has been long known not only as the able conductor of the Ephemeris published annually at Berlin, (a work which for many years tended more than any other to promote the advancemeut of astronomy, by the circulation of important and useful information on various branches of the science,) but also as the author of several valuable works conducive to the same end; amongst which his Catalogue of 17,2[illegible] stars (reduced from the observations of various astronomers,) and his charts of the same, may be considered as the most important. He died at the advanced age of 80 years.

M. Fraunhofer has long been celebrated as a distinguished optician, and as an artist of the first class. Few of the specimens however of his superior talent have reached *this* country; but on the continent, where they are more numerous, their value is highly appreciated, though not an astronomer himself, he has the strongest of claims to the respect and gratitude of astronomers, in furnishing them with means of discovery, in which the most exquisite skill in point of practical execution was directed by the utmost refinement of theoretical knowledge. He was in the highest sense of the word, an optician, an original discoverer in the most abstruse and delicate departments of his science, a competent mathematician, an admirable mechanist, and a man of a truly philosophical and scientific turn of mind.

Raised by his extraordinary talents from the lowest station in a manufacturing establishment, to the direction of the optical department of the business in which he originally laboured as an ordinary workman, he applied the whole power of his mind to the perfection of the refracting telescope. Easily mastering the refinements of its theory, he saw with regret that they were for the most part unavailable in practice for want of precise knowledge of the optical properties of the materials used. This he set about to remedy; and by a series of admirable experiments (of which it is impossible in a report of this nature to give any idea) succeeded in giving to optical determinations the precision of astronomical observations, surpassing in this respect all that had gone before him, exeept perhaps his great predecessor NEWTON. He had, it is true, advantages in these researches (such as neither Newton nor any other experimenter has ever possessed) in a command of apparatus limited only by his own inventive powers. It was in the course of these researches that he was led to the important discovery of the dark lines which occur in the solar spectrum. In this, indeed, he was in some degree anticipated by an illustrious countryman of our own, to whose powers universal sciencc bears grateful testimony. But it is certain that he had no knowledge of the facts thus previously ascertained, and that he pushed his discovery to a point very far beyond them; being aided in so doing by possessing the happy secret of manufacturing flint glass of perfect homogeneity. Whether he originally invented this process, or procured it from another, this is not the occasion to pronounce; but at least his own distinct assertion that he brought it to its final state of perfection, and to a certainty of manipulation by his personal investigations, ought not to be doubted. Nor did he suffer the secret to lie idle or useless,—his telescopes are scattered over Europe; and his last splendid performance has already demonstrated, by the results it has afforded, his claims to unbounded admiration as an artist. The mechanism employed in the working of his glasses, his mode of centering and adjusting them, and every other part of his processes (the fabrication of his glass only excepted) has been witnessed by more than one member of this Society. It bore the stamp of all his works—Simplicity, regularity, and incomparable neatness and precision.

Of his other valuable experiments and discoveries in physical optics, connected with the interferences of the rays of light, (in all of which, though pushed far in advance of the actual state of knowledge, he appears to have relied entirely on his own resources, and drawn little from others,) as less connected with astronomy, it is not necessary here to speak. He died at a premature age; his death being accelerated, it is said, by the unwholesome nature of the processes employed in his glass-house, leaving behind him a reputation rarely if ever attained by one so young.

Of M. Piazzi and his labours, it will also be interesting to the Society to receive a concise account as this distinguished individual furnishes another example, in addition to the many already upon record, of the power of genius to deliver a man from pursuits for which he had no taste, and to carry him successively through others, to promote which he was richly qualified. Piazzi was born at Ponte, in the Valteline, July 16th 1746, and died at Naples, July 22nd 1826. Early in life he was devoted to a religious order denominated the *Theatins*, at Milan. But, after various changes, he in 1780 accepted the appointment of Professor of the Higher Mathematics in the Academy of Palermo; and from that time, entirely devoted himself to science.

In a few years he obtained the confidence and favour of the Prince of Caramanico, viceroy of Sicily, by whose permission and assistance he founded an observatory at Palermo. With a view to open an intercourse with astronomers, and to obtain valuable instruments for his observatory, he visited England, where he formed an intimacy with Maskelyne, Herschel, Vince, and Ramsden. From the last of these he obtained some very excellent instruments, and, amongst the rest, the Altitude and Azimuth instrument with which his principal observations were made. From this time Piazzi cherished a warm attachment both to the English and to their language; and to the latest period of his life continued to evince the same esteem.

While he was in England, Piazzi observed at Greenwich, in conjunction with Maskelyne, the solar eclipse of June 3rd, 1788. He also collected the corresponding observations of eighteen different astronomers in various parts of Europe, and deduced from them the differences in longitude of the several observatories from that of Greenwich. The results he published in the *Philosophical Transactions* for 1789 (vol. lxxix); and the circumstance is here recorded, as this paper is understood to be M. Piazzi's earliest production as an astronomer.

In 1789 he commenced with great activity, his labours in his new observatory, then the most southern which existed in Europe; that at Malta having been recently destroyed by fire.

On the 1st of January 1201 he discovered the planet *Ceres*.

The principal circumstances of that discovery, being well known to astronomers, need not be detailed here. But it is due to the character of this distinguished individual, to state, that when the king of Naples announced his intention of perpetuating the event by the circulation of a gold medal among European observers, Piazzi, whose modesty and zeal were equal to his merit, requested the monarch to assign the proposed value of the medals to the purchase of an *equatorial,* which he thought was greatly needed in his observatory.

In 1803 he published the result of a labour of twelve years, undertaken with a view to determine *the mean position of the principal stars:* for this work he received the medal from the Royal Academy of Sciences at Paris.

In 1814 was published M. Piazzi's *New Catalogue,* from which it appeared that this indefatigable astronomer had actually extended his researches to 7646 stars!

Early in 1817 M. Piazzi published his *Lessons on Astronomy,* and the same year he was called to Naples, to put into activity the new observatory established on the heights of *Capodi-Monte.* Cacciatore (now also one of the Associates of this Society) has from that time taken the charge of the observatory at Palermo; and by his zeal and assiduity is emulating the conduct of his predecessor.

The subsequent labours of this indefatigable astronomer, are as universally known as they are highly appreciated, throughout Europe. The grand work, however, to which we have already adverted (*the Catalogue of* 7646 *stars*) will ever remain a monument of his superior activity and perseverance, as long as the science endures. This important work far exceeds every thing of the kind that has preceded it; and shows more powerfully than words can express, what may be effected by the talents and assiduity of *one* individual.

The will of this eminent astronomer furnishes a new proof of his cordial desire to contribute perpetually to the promotion of his favourite science. He has bequeathed his library and all his instruments to the observatory at Palermo; and has assigned a liberal annuity to be devoted in succession to the instruction of young men who evince a marked partiality for the interesting department of knowledge.

The Council trust that the several members of this Society re quire no additional excitement to promote and advance the cause in which they have so laudably embarked. They should recollect, however, that without their cordial co-operation and assistance, the labours and efforts of the Council will be in vain. For, the *Council* are merely the officers of the Society and can only collect and arrange the subjects that present themselves. To the *individuals* of the Society it more properly belongs to furnish those subjects which may tend to the improvement of the science, either theoretically or practically. The Council have, indeed in some of their former Reports, ventured to suggest several points as more particularly worthy of the attention of the Members, but it must be obvious to every one, that these are a *few* only of the desiderata in Astronomy; and that many others will suggest themselves to every skilful and intelligent observer.

The meeting then proceeded to the election of Officers for the ensuing year, when the following List was delivered in by the scrutineers: viz.

President: J. F. W. Herschel, Esq. M. A. F. R. S. L. & E. M. R. I. A. F. G. S. & M. R. I. A.

Vice-Presidents: Capt. F. Beaufort, R. N. F. R. S.; Lieut. Gen. Sir T. M. Brisbane, K. C. B. F. R. S. L. & E.; Henry Thomas Colebrooke, Esq. F.R.S. L. & E. F.L.S. & G.S.; James South, Esq. F.R.S. & L.S.

Treasurer:—Rev. William Pearson, L.L.D. F.R.S.

Secretaries:—Olinthus G. Gregory, L.L.D. *Prof. Math. Roy. Mil, Acad. Woolwich*; Lieut. W. S. Stratford, R.N.

Foreign Secretary:—Charles Babbage, Esq. M.A. F.R.S. L. & E. & M.R.I.A.

Council:—Francis Baily, Esq. F.R.S. L.S. & G.S. & M.R.I.A.; Col. Mark Beaufoy, F.R.S. & L.S.; Lieut. Col. Thomas Colby, R.E. L.L.D. & F.R.S. L. & E.; Capt. George Everest; Davies Gilbert, Esq. M.P. V.P.R.S. F.L.S. & G.S.; Benjamin Gompertz, Esq. F.R.S.; Stephen Groombridge, Esq. F.R.S.; James Horsburgh, Esq. F.R.S.; Right Hon. Lord Oxmantown; Edward Riddle, Esq.

Antiquity of Steam Vessels.

A work has lately been published in Spain, by one of the secretaries of the king, and printed at the royal press, containing original papers, relating to the voyages of Columbus, which had not previously been published, and which have been collected with great care, from the ancient archives, and libraries of Spain.

The following remarkable statement, appears as a note, in the first volume of the work. It will be seen, that it ascribes the invention of the steam-boat to a Spaniard, nearly three hundred years ago. We copy this article from the last number of the North American Review, the editor of which, has translated it from the original.

Circumstantial as is the account given, we confess, that it appears to us, to have been written since the days of Fulton. This statement, was communicated to the author in a letter from *Thomas Gonzalez*, dated at Salamanca, the twenty-seventh of August, 1825: and it would appear that he had recently consulted the public records, to which he refers.

When these 'public records,' shall appear in an authentic form, their evidence must be admitted, but until then, we shall not be inclined to commence the history of the invention of the steam-boat, so far back as the year 1543.—*Editor.*

'Blasco de Garay, a sea captain, exhibited to the emperor and king, Charles the Fifth, in the year 1543, an engine, by which ships and vessels of the largest size, could be propelled, even in a calm, without the aid of oars or sails.

Notwithstanding the opposition which this project encountered, the emperor resolved, that an experiment should be made, as in fact it was with success, in the harbour of Barcelona, on the 17th of June, 1543.

Garay never publicly exposed the construction of his engine, but it was observed at the time of the experiment, that it consisted of a large cauldron or vessel of boiling water, and a moveable wheel attached to each side of the ship.

The experiment was made on a ship of two hundred tons, arrived from Colibre, to discharge a cargo of wheat at Barcelona; it was called the Trinity, and the captain's name was Peter de Scarza.

By order of Charles the Fifth, and the prince, Philip the Second, his son, there were present at the time, Henry de Toledo, the governor Peter Cardona, the treasurer Ravago the Vice Chancellor Francis Gralla, and many other persons of rank, both Castillians and Catalonians; and among others, several sea captains witnessed the operation, some in the vessel, and others on the shore.

The emperor and prince, and others with them, applauded the engine, and especially the expertness with which the ship could be tacked. The treasurer, Ravago, an enemy to the project, said it would move two leagues in three hours. It was very complicated and expensive, and exposed to the constant danger of bursting the boiler. The other commissioners affirmed that the vessel could be tacked twice as quick as a galley, served by the common method, and that at its slowest rate, it would move a league in an hour.

The exhibition being finished, Garay took from the ship his engine, and having deposited the woodwork in the arsenal of Barcelona, kept the rest himself.

Notwithstanding the difficulties and opposition thrown in the way by Ravago, the invention was approved, and if the expedition, in which Charles the Fifth was then engaged, had not failed, it would undoubtedly have been favoured by him. As it was, he raised Garay to a higher station, gave him a sum of money (200,000 maravedies) as a present, ordered all the expenses of the experiment to be paid out of the general treasury, and conferred upon him other rewards.

Such are the facts collected from the original registers, preserved in the royal archives at Samancas, among the public papers of Catalonia, and those of the secretary at war, for the year 1543.

Revolution of a Comet.—The zeal with which interests of science were forwarded in New Holland, by Sir T. Bresbane, deserves the warmest acknowledgements of every liberal mind. Among the most curious results obtained under his patronage, by Mr. Dunlop, at the observatory of Paramatta, may be considered the one arising from the observations, on the comet of August, September, and October, 1825, and on the changes which took place in the figure of the tail; tending to establish the existence of a rotation round its axis. The periodic variations in the appearance of the tail, seemed to indicate the time of revolution to be about nineteen and a half hours. Similar appearances were observed by Le Pere Cyrat, in the tail of the comet of 1618, by Hevelius, in the tails of the comets of 1652 and 1661, and by Pingre, in the tail of the comet of 1769.

Botany.—The celebrated Dutch naturalist, Dr. C. C. Blume, has safely returned to Europe, after nine years' residence in the island of Java. Favoured by circumstances, and devoting himself with indefatigable zeal to the natural history of that remarkable island, he has brought home immense collections of natural productions of every kind; and when we recollect how little this branch of science, connected with the Dutch possessions in India, has been cultivated since the time of Rumpf and Rheede, and how unfortunate the more recent laudable endeavours of Messrs. Kuhl and Van Hasselt, as well as those of the English naturalists, Arnold and Jack, proved, in consequence of the fatal influence of the climate, we may congratulate ourselves on the safe return of this able artist. It may be expected that he will publish an extensive work on the Botany of the Dutch East India colonies.

Method of restoring Wine.—A method of restoring wine that has been turned, has been in practice for some years in France. It consists in adding from half an ounce to two ounces of tartaric acid to a hectolitre of wine, according to its state of decomposition. The tartaric acid reproduces the tartar, disengages the carbonic acid, and consequently destroys the alkaline character given to the wine by the sub-carbonates. From the impossibility of determining the exact quantity for every case, this method is not always successful.

Jet discovered in Wigtonshire.—Beautiful specimens of this mineral have been found between a bed of peat and yellow clay, in the Peninsula formed by Loch Ryan and the Irish Channel, by Sir Andrew Agnew.—*Jameson's Edinb. Journ.*

Improved Barometer.—Much ingenuity has been displayed in contriving methods whereby the mercury in the cistern of a barometer may be kept at a constant level;

floating gages, moveable bottoms, &c. &c., have been had recourse to, all more or less objectionable, either from the insufficiency of the means employed, or the difficulty of their application. An extremely simple, but admirable contrivance of Sir Humphrey Davy, has supplied the desideratum. The pinion that raises the vernier, by which the height of the mercury is led off, depresses at the same time, and, in the same degree, into the reservoir, a steel plunger, the size of which exactly corresponds to the interior diameter of the tube of the instrument.

Winter Food for Cows.—M. Chabert, the director of the veterinary school at Alfort, had a number of cows, which yielded twelve gallons of milk every day. In his publications on the subject, he observes, that cows fed in the winter upon dry substances, give less milk than those which are kept upon a green diet, and also that their milk loses much of its quality. He published the following recipe, by the use of which his cows afforded an equal quantity and quality of milk during the winter, as during the summer:—Take a bushel of potatoes, break them whilst raw, place them in a barrel standing up, putting in successively, a layer of potatoes and a layer of bran, and a small quantity of yeast in the middle of the mass, which is thus left to ferment during a whole week; and when the vinous taste has pervaded the whole mixture, it is given to the cows, who eat it greedily.

Ancient Roman Foot.—From the inquiries of M. Cagnazzi, to whom the scientific examination of the monuments of antiquity found in Herculaneum and Pompeii, was intrusted by the Neapolitan Government. It appears, that the ancient Roman foot was 0·29,624 of a metre, or 131,325 lines, French measure.

New Patents Sealed 1827.

To Robert Barlow, of Jubilee-place, Chelsea, in the County of Middlesex, for his having invented a new combination of machinery, or new motion for superseding the necessity of the ordinary crank in steam-engines, and for other purposes where power is required—Sealed 1st February—6 months.

To John Frederick Daniel, Esq. of Gower-street, Bedford-square, in the County of Middlesex, for his having invented improvements in the manufacture of gas—1st February—6 months.

To John Oldham, of the City of Dublin, Gent. for his having invented or found out certain improvements in the construction of wheels designed for driving machinery, which are to be impelled by water or by wind, and which said improvements are also applicable to propelling boats and other vessels—1st February—6 months.

To Ralph Hindmarsh, of the Town and County of Newcastle-upon-Tyne, master mariner, for his having invented or found out an improvement in the construction of capstans and windlasses—1st February—6 months.

To Robert Stirling Clerk, Minister of Galston, in Ayrshire, North Britain, and James Stirling, engineer, in Glasgow, Lanershire, North Britain, for their having invented and found out certain improvements in air engines for moving of machinery—1st February—6 months.

To John White, of Southampton, in the county of Hants, engineer and iron founder, for his having invented certain improvements in the construction of pistons or buckets for pumps—1st February—6 months.

To Samuel Parker, of Argyle-place, Argyle-street, in the City of Westminster, and County of Middlesex, bronzist, for his having invented or found out certain new improvements in the construction of lamps—1st February —2 months.

To Antoine Adolphe Mariellan Marbott, of No. 38, Norfolk-street, Strand, in the County of Middlesex, merchant, in consequence of a communication made to him by a certain foreigner residing abroad, with whom he is connected, for an invention of certain improved machinery, for working or cutting wood into all kinds of mouldings, rebates, cornices, or any sort of fluted work —3rd February—6 months.

To Sir William Congreve, of Cecil-street, Strand, in the County of Middlesex, Baronet, for his having invented a new motive power—8th February—6 months.

To William Stratton, of Limehouse, in the County of Middlesex, engineer, for his having invented or found out an improved apparatus for heating air by means of steam —12th February—6 months.

To John George Christ, of the Old City Chambers, Bishopsgate-street within, in the City of London, Gent. in consequence of a communication made to him by a certain foreigner residing abroad for certain improvements in copper and other plate printing—14th February—6 months.

To Philip Jacob Heisch, of America-square, in the City of London, merchant, in consequence of a communication made to him by a certain foreigner residing abroad, with whom he is connected, for certain improved machinery for spinning cotton—20th February—2 months.

To Charles Barwell Coles, late of Duke-street, Manchester-square, in the County of Middlesex, Esq. and William Nicholson, of Manchester, in the County of Lancaster, civil-engineer, in consequence of a communication made to him by a certain person residing abroad; for a certain invention or new method of constructing gas-meters, or machines or apparatus for holding and distributing gas, for the purpose of illumination—20th February—6 months.

To William Benecke, of Deptford, in the County of Kent, Gentleman, in consequence of a communication made to him by M. William Pescatore, a foreigner residing at Luxemburgh, in the kingdom of the Netherlands, (on whose behalf this patent is taken,) for an invention of a machine for grinding or crusting seeds, and other olaginous substances, for the purpose of extracting oil therefrom—20th February—6 months.

To William Jefferies, of London-street, Radcliffe, in the County of Middlesex, brass manufacturer, for his invention of certain improvements in calcining or roasting and smelting or extracting metal and semi-metals from various kinds of ores, and matter containing metals or semi-metals—20th February—6 months.

To Pierre Erard, of Great Marlborough-street, in the County of Middlesex, musical instrument maker, in consequence of communications made to him by a certain foreigner, residing abroad, and discovered by himself, for an invention of certain improvements in the construction of piano-fortes—20th February—6 months.

To Augustus Count de la Garde, of St. James's-square, Pall-Mall, in the County of Middlesex, in consequence of a communication made to him by a certain foreigner residing abroad, for a method of making paper, of various descriptions from the bullen or ligneous parts produced from certain textile plants; in the process of preparing the same textile plants, by the rnral mechanical brake (for the exclusive use of which he has already applied for a patent), and which substances are to be employed alone or mixed with other suitable materials in the manufacture of paper—20th February—6 months.

To William Smith, of Sheffield in the County of York, merchant for his improved method of manufacturing cutlery and other articles of hardware, with, or by means of rollers—20th February—6 months.

METEOROLOGICAL JOURNAL, January and February, 1827.

1827.	Thermo.		Barometer.		Wind.	Weather.
	Max	Min.	Morn.	Even.		
Jan.						
27	32	22	29,67	30,06	N.	Hard frost—fair
28	38	26	29,96	29,78	S.W.—S	Thaw—wind
29	46	37	29,78	29.63	S.W.	Ditto—cloudy
30	43	35	29,62	29,58	S W.	Slight frost—thaw—cloudy
31	44	39	29,56	29,60	S.W.—W.	Cloudy—fog
Feb.						
1	44	36	29,60	29,64	S.—S. W—N.W	Ditto—with rain
2	39	30	29,74	29,94	N. E.—N.	Cloudy—snow—shower—wind
3	32	26	30.22	30,35	N.E.	Fair—frost—wind
4	34	27	30,34	30,32	N.E.—E.	Ditto—ditto
5	34	27	30,31	30,13	E.	Ditto—ditto
6	36	29	30,10	30,17	N.E —N.	Fog—cloudy—damp
7	38	30	30,21	30,24	N.E.	Fair—clear—frost
8	37	27	30,29	30,29	E.	Ditto—ditto—wind
9	34	26	30,22	30,12	E.	Ditto—ditto—ditto
10	37	25	30,02	29,84	E.—N.E.	Ditto—ditto—ditto
11	33	33	29,72	29,68	E.	Cloudy—frost—ditto
12	37	31	29,72	29,78	N.E.	Ditto—ditto—snow and hail
13	35	31	29,90	29.96	E.—N.E.	Stormy—fine—snow
14	36	30	29,87	29,73	N. W.—W.	Ditto—ditto—ditto
15	38	27	29,73	29,85	N.—N.E.	Ditto—ditto—ditto
16	32	20	29,94	29,87	S.W.—W—N.	Ditto—ditto—ditto
17	33	18	29,76	29,80	W.—N.W.—N.	Fair—hard frost—wind
18	32	14	29,87	29,91	E.	Cloudy—ditto—high wind
19	32	17	29,81	29,64	E	Fair—ditto—ditto
20	33	19	29,60	29,55	E.—N.E.	Ditto—ditto—ditto
21	36	30	29,54	29,61	E.—N.E.	Cloudy—ditto—wind
22	37	27	29,09	29,85	N.E.	Stormy—frost—hail
25	38	24	29,85	29,82	N.W.—W.	Cloudy—ditto—fair

Hitchen, Herts. WATSON PERKS.

D.	H.	M.	S.	
1	0	0	0	Clock before the ⊙ 12′ 44″
1	0	0	0	♄ Stationary.
1	6	0	0	♂ in conj. with ξ in Pisces.
3	10	51	43	♃'s 1st Sat. will immerge.
4	14	0	0	☽ in conj. with ε in Taurus.
5	6	27	0	☽ in □ first quarter.
5	0	0	0	Clock before the ⊙ 11′ 54″.
5	22	0	0	☽ in conj. with ζ in Taurus
6	23	0	0	☽ in conj. with γ in Gemini.
9	21	0	0	☾ in conj. with 1 α in Cancer
9	22	0	0	☾ in conj. with 2 α in Cancer
10	0	0	0	Clock before the ⊙ 10′ 40″
10	12	45	24	♃'s 1st Satt. will immerge.
11	4	0	0	☽ in conj. with π in Leo.
13	0	9	0	Ecliptic Opposition or ◉ Full Moon.
13	2	0	0	☾ in conj with υ in Leo.
15	0	0	0	Clock before the ⊙ 6′ 18″
15	2	0	0	☾ in conj. with α in Virgo.
16	14	0	0	☾ in conj. with 2 α in Libra
17	11	0	0	☾ in conj. with κ in Libra
17	14	39	11	♃'s 1st Sat. will immerge
17	16	0	0	☾ in conj. with λ in Libra
17	21	0	0	☾ in conj. with 1 β in Scorpio.
17	21	0	0	☾ in conj. with 2 β in Scorpio
17	23	0	0	☾ in conj. with γ in Scorpio
18	4	0	0	☿ in conj. witn ε in Pisces.
19	2	0	0	☾ in conj. with ϱ in Oph.
19	20	22	0	☾ in □ last quarter.
20	0	0	0	Clock before the ⊙ 7′ 49″
20	0	0	0	☾ in conj. with 2 μ in Sagitt
20	16	59	27	♃'s 2d Sat. will immerge.
20	21	3	0	⊙ enters Aries.
21	2	0	0	♀ in conj. with δ in Sagitt.
22	5	0	0	☾ in conj. with β in Capri.
24	16	33	3	♃'s 1st Satt. will immerge
26	0	0	0	Clock before the ⊙ 5′ 59″
26	0	0	0	☿ Stationary.
26	11	1	34	♃'s 1st Sat. will immerge
27	0	2	0	Ecliptic conj. or ● New Moon.
28	1	0	0	☽ in conj. with ☿ long. 20° in o Sign ☽ lat. 2° 17′ N. ☿ lat. 3° 22′ N. diff. lat. 1° 5′.
29	14	0	0	☽ in conj. with ♂ long. 7° in Taurus ☽ lar. 35′ N. ♂ lat. 13 N. diff. lat. 22.
31	11	32	71	♃'s 2nd Satt. will emerge
13	22	0	0	☽ in conj. with ε in Taurus.

The waxing ☽ moon—the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL FOR JANUARY AND FEBRUARY, 1827.

1827.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.	
JAN.					
26	35	8	29,77	29,55	
27	35	23	30,10	29,94	
28	40	12	30,03	29,90	
29	50	35	29,88	29,75	
30	40	30	29,67	stat.	
31	47	30	29,62	29,60	
FEB.					
1	47	38	29,66	29,64	
2	40	33	29,90	29,76	
3	34	27	30,38	30,18	
4	39	25	30,40	stat.	
5	38	29	30,36	30,30	
6	29	21	30,20	30,16	
7	39	29	30,28	30,24	
8	37	25	30,30	30,28	
9	37	26	30,24	30,18	
10	34	25	30,05	29,90	
FEB.					
11	34	26	29,74	29,70	
12	39	29	29,78	29,70	
13	38	30	30 ,00	29,92	
14	40	26	29'97	29,84	
15	39	29	29'84	29,78	
16	29	17	30'00	stat.	
17	27	14	29'84	29,83	
18	28	10,5	29'90	stat.	
19	30	21	29'86	29,70	
20	35	19	29'60	29,58	
21	40	27	29'58	29,57	
22	39	30	29'90	29,70	
23	40	20	29'92	29,89	
24	42	21	29,90	29,80	
25	42	16	30,03	29,93	

LOWER EDMONTON. CHARLES H. ADAMS.

Lat. 51° 37′ 32″ N. Long 0° 3′ 51″ W. of Greenwich.

LITERARY AND SCIENTIFIC NOTICES.

NEARLY ready for publication, in one volume quarto, "Travels from India to England, comprehending a Visit to the Burman Empire, and a Journey through Persia, Asia Minor, European Turkey, &c., in the years 1825-26; containing a Chronological Epitome of the late Military Transactions in Ava, and an account of the proceedings of the present Mission from the Supreme Government of India to the Court of Taheran; and a Summary of the Causes and Events of the existing war between Russia and Persia; with Sketches of Natural History, Manners, and Customs. The work will be illustrated with Maps, and coloured Lithographic Prints. By James Edward Alexander, Esq. H.P. late of the 13th Light Dragoons, and attached to the Suite of Colonel Macdonald Kinneir, K. L. S., Envoy Extraordinary to the Court of Taheran."

Reports have reached town, through the medium of the North West Company, that Captain Franklin had accomplished the objects of his over land expedition, and had fallen in with, and embarked on board, His Majesty's Ship Blossom, which had been sent for the purpose of meeting him in Behring's Straits.

"LONDON AND ITS VICINITY."—The first two Numbers of this highly interesting work of Mr. George Cooke's has made its appearance, and though not so highly laboured as many of his preceding works, yet it is in every way calculated to keep up his great reputation as a Landscape Engraver of the first order. The subjects of the Plates, of which there are four in each Part, are, Stratford le Bow; London Bridge; Hornsey; Prison Ship, Deptford; Clock House, St. Albans; Windsor; Ship-breaking, at Wapping; and the Sessions House, Clerkenwell; all of which have been delineated by the Artist in a very masterly style. To say the least, the work is an interesting graphic treat. Four of the representations have been enriched by characteristic groups of figures, by Mr. Callcott.

Mr. Brockedon has nearly ready, the first Number of his Illustrations of the Passes of the Alps, by which Italy communicates with France, Switzerland, and Germany; from Drawings made during the five Summers, from 1821 to 1826.

It is said, that this able Artist, and intelligent observer, has literally crossed the Alps forty times in pursuit of this object; maintaining, that the pass of the Little Saint Bernard was the route of Hannibal the Carthaginian General.

Mr. Henry William Dewhurst, Surgeon, F. A. S.; author of a Dictionary of Anatomy, &c., has a work in the press entitled, A Guide to Phrenology; and he is also preparing for publication, The Anatomy and Physiology of the Eye, with an explanation of the Theory of Vision, with Engravings.

GAS LIGHTING.—The experiment of lighting the Clocks of Churches by night, is about to be tried in London, on the dial of St. Bride's Church, Fleet Street Preparations are now making, and it is presumed in about a month the arrangements will be complete.

NATURAL HISTORY, &c.—It is with great pleasure we learn, that a large portion of the MSS. drawings, and property belonging to the unfortunate Captain Lyon, has been recovered from the wreck of the vessel in which he returned from Mexico, and which was lost off the Irish Coast, Among his other acquisitions, we learn that this gallant and intelligent officer has brought home a fine ornithological collection, which contains several species of birds till yet unknown. They are being prepared and classed.

A quarto volume is in the press, under the title of Heraldic Notices of Canterbury Cathedral; with Geneological and Topographical Notes, &c. By Thomas Willement, Author of Regal Heraldry.

LONDON:
JOSEPH SHACKELL, PRINTER, KIRBY STREET, HATTON GARDEN.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LXXVIII.

Recent Patents.

To JAMES YANDAL, *of Cross Street, in the District of St. John's, Waterloo Road, in the County of Surrey, Private person, for his Discovery of an Improvement or Improvements on Apparatus for Cooling and Heating Fluids.*

[Sealed 24th August, 1826.]

THIS is an apparatus designed for cooling worts and other hot fluids, without exposing them to evaporation. Utensils employed for this purpose, are generally called refrigerators, and are so constructed, that a quantity of cold water shall be brought in contact with the vessel which contains the heated fluid. But in every construction of refrigerator heretofore used, the quantity of cold water necessarily employed in the operation, greatly exceeded the quantity of the fluid cooled, which, in some situations where water cannot be readily obtained, is a serious impediment and objection to the use of such apparatus.

The inventor has contrived a mode of constructing a refrigerator, so that any quantity of wort or other hot fluid, may be cooled by an equal quantity of cold water; the process being performed with great expedition, simply by passing the two fluids through very narrow passages, in opposite directions, the result of which is, that the cold liquor imbibes the heat from the wort, or other hot fluid, and the temperature of the hot fluid is reduced in the same ratio.

The patentee commences his specification by saying, "Previously to describing my improved apparatus, I think it right to make a few observations on my discovery, and the general nature or principles upon which my apparatus is constructed. If two fluids of different temperatures be brought nearly together, separated only by a thin metallic partition, and the surfaces of the two fluids be greatly extended, or thinly spread, compared to their quantity or volume, a rapid interchange of temperature will take place, (assimulated to mixing), and each of them will acquire the medium temperature in a very short space of time. Now if the two fluids be made to pass each other in opposite directions, through a vessel or apparatus having contiguous passages, so that the temperatures of the liquors may act upon each other, separated by a thin metallic surface, greatly extended, compared to the quantity or volume of the liquor; or in other words, so that two thin sheets or lamina, (as they may be called), one of hot fluid, the other of cold, be made to act upon each others temperature, passing in opposite directions, and the thickness of such sheets or lamina of fluid, do not exceed half an inch, and may be as thin as one sixteenth of an inch, the interchange of temperature will rapidly take place, and with nearly the same effect as if they were mixed together; and if these contiguous passages be of sufficient length, I find, that the hot fluid entering its passage at one end of the apparatus, and the cold fluid entering its passage at the reverse end of the apparatus, there will be very nearly a complete transfusion of heat, and by actual experiment I have found, that wort, or other heated fluid, entering my apparatus at a temperature above 200° Fahr. will pass out at a temperature of 60° Fahr. while the water entering at 56°, will come out at a temperature above 190°; a little heat being necessarily lost by radiation, or the exchange of temperature would be more complete. Having made these general explanatory observations, I proceed to describe my apparatus."

Plate III, figs. 1, 2, and 3, represent different forms in which the apparatus is proposed to be made. The two first have zigzag passages, the third, channels running in convolute curves. These channels or passages, are of very small capacity in thickness, but of great length, and of any breadth that may be required according to the quantity of fluid intended to be cooled or heated.

Fig. 4, is the section of a portion of the apparatus, (shewn at figs. 1, and 2, upon an enlarged scale, it is made by connecting three sheets of copper or any other thin metallic plates together, leaving parallel spaces between each plate, for the passage of the fluids, represented by the black lines.

These spaces are formed by occasionally introducing between the plates, thin straps, ribs, or portions of metal, by which means very thin channels are produced, and through these channels the fluids are intended to be passed, the cold liquor running in one direction, the hot in the reverse direction.

Supposing that the passages for the fluids are each one eighth of an inch thick, then the entire length for the run of the fluid, should be about eighty feet, the breadth of the apparatus being made according to the quantity of fluid intended to be passed through it in a given time. If the channels are made a quarter of an inch thick, then their length should be extended to a hundred and sixty feet; and any other dimensions in similar proportions; but a larger channel than one quarter of an inch, the patentee considers would be objectionable. It is however to be observed, that the length here recommended is under the consideration that the fluids are driven through the apparatus by some degree of hydrostatic pressure from a head in the delivery vats above, but if the fluids flow without pressure, then the lengths of the passages need not be quite so much extended.

In the apparatus constructed as shewn in perspective, at fig. 1, and further developed by the section fig. 4, cold water is to be introduced at the funnel *a*, whence it passes down the pipe *b*, and through a long slit or opening, in the side of the pipe, into the passage *c*, *c*, (see fig. 4,) between the plates, where it flows in a horizontal direction through the channel, towards the discharge pipe *d*. When such a quantity of cold water has passed through the funnel *a*, as shall have filled the channel *c*, *c*, up to the level of the top of the apparatus, the cock *e*, being shut, then the hot wort or other liquor intended to be cooled, may be introduced at the funnel *f*, and which, descending in the pipe *g*, passes in a similar manner to the former, through a long slit or opening, in the side of the pipe *g*, into the extended passage *h*, *h*, (see fig. 4,) and from thence proceeds horizontally into the discharge pipe *i*.

The two cocks *e*, and *k*, being now opened, the wort, or other liquor is drawn off, or otherwise conducted away through the cock *k*, and the water through *e*. If the apertures of the two cocks *e*, and *k*, are equal, and the channels equal also, it follows, that the same quantity of wort, &c. will flow through the channel *h*, *h*, *h*, in a given time, as of water through the channel *c*, *c*, and by the hot fluid passing through the apertures in contact with the side of the channel which contains the cold fluid, and in a contrary direction to that of the cold fluid, the heat becomes abstracted from the former, and communicated to the latter, and as the hot fluid enters the apparatus at that part which is in immediate contact with the part where the cooling fluid is discharged, and the cold fluid enters the apparatus at that part where the wort is discharged, the consequence is, that the wort, or other hot liquor, becomes cooled down towards its exit pipe, nearly to the temperature of cold water; and the temperature of the water at the reserve end of the apparatus, becomes raised nearly to that of the boiling wort.

It only remains to observe, that by partially closing either of the exit cocks, the quantity of heat abstracted from one fluid, and communicated to the other, may be regulated; for instance, if the cock *e*, of the water passage be partially closed, so as to diminish the quantity of cold water passed through the apparatus, the wort or other hot fluid conducted through the other passages will be discharged at a higher temperature, which in some cases will be desirable, when the refrigerated liquor is to be fermented.

Fig. 2, exhibits an apparatus precisely similar to the foregoing, but different in its position, for instance, the zigzag channels are made in ascending and descending plains. *a*, is the funnel for the hot liquor, whence it descends through the pipe *d*, into the channel *c*, *c*, (see fig. 4,) and ultimately is discharged through the pipe *b*, at the cock *e*. The cold water being introduced into the funnel *f*, and passing down the pipe *i*, enters the zigzag channel *h*, *h*, and rising through the apparatus, runs off by the pipe *g*, and is discharged at the cock below.

The passages of this apparatus for heating and cooling fluids, may be bent into various contorted figures, one form found particularly convenient under some applications, is that represented at fig. 3, which is contained in a cylindrical case. The passages here run in convolute curves the one winding in a spiral to the centre, the other receding from the centre.

The wort or other hot liquor intended to be cooled, is to be introduced at the funnel *a*, and passing down the pipe *b*, is delivered into the open passage *c*, which winds round to the central chamber *d*, and is thence discharged through the pipe *e*, at the cock *f*. The cold water enters the apparatus, at the funnel *g*, and proceeding down the pipe *h*, enters the closed channel *i*, and after traversing round through the apparatus, is in like manner discharged through the pipe *k*, at the cock *l*. Or the hot liquor may be passed through the closed channel, and the cold, through the open one; or these chambers may be both of them open at top, and the apparatus covered by a lid when at work, the principle design of which, is to afford the convenience of cleaning them more readily than could be done if they were closed, or they may be both closed.

The apparatus constructed upon any of the above plans is calculated to be adapted with great advantage in place of the ordinary worm of a still, its power of cooling, and condensing the vapour, greatly exceeding any other description of refrigerator, and at a much smaller expense of cold water or other cooling fluids, as in this case the wash prepared for distillation, may be passed through the apparatus in place of cold water, and by extracting the heat from the distilled vapour, in the adjoining channel, (which must here be closed), will condense the spirit therein, and have its own temperature raised at the same time, almost to the boiling point. Under these circumstances, the apparatus will be both a califyer, and a refrigerater, and be the means of effecting a great saving of fuel in the process of distillation.

This apparatus must be considered as a great improvement upon the refrigerating worm heretofore used; in consequence of its exposing a surface so much more extended; and by the employment of a stream of cold liquor running in opposition to the course of the condensed fluid, the temperature never varies, the termination of the cooling process being as perfect as the commencement.

When this apparatus is adapted to a steam engine, it causes a very rapid condensation of the steam, by a small expenditure of water, and thereby will in a great degree, dispense with the necessity of the air-pump, (which is a minus power exerted against the engine), or at least it will so much assist the operation, that a comparatively small air-pump, will be required, and the water heated in passing through the apparatus, may be immediately conducted into the boiler, at a boiling temperature, or nearly so.

The patentee says, "it will be unnecessary to point out all the situations or circumstances in which this apparatus for heating and cooling fluids may be applied, as I have already explained generally its extensive employment in several branches of the arts, and the manner of constructing it, as well as the proportionate dimensions being set out, it only remains to say, that those dimensions are to be enlarged in due proportion, in constructing an apparatus of greater magnitude than those above described, but I wish to observe, that I do not approve in any case, of making the channels more than half an inch in width."

[*Inrolled February*, 1827.]

To Augustin Lewis Hunout, *of Brewer Street, Golden Square, in the County of Middlesex, Gentleman, in consequence of a communication made to him by a certain Foreigner residing abroad, for certain Improvements in Artillery, Musquetry, and other Fire Arms.*

[Sealed 23d April, 1825.]

The improvements suggested by the patentee, are designed to facilitate the rapid discharge of fire-arms, by supplying several loadings of powder and ball to the barrel of the piece at one time, which loadings are to be discharged in succession, without altering the position of the piece or re-loading it. The contrivance is proposed to be applied to cannon, musquetry, and small arms, and consists in adapting a tube, which is to contain several charges, to the interior of the ordinary barrel.

The tube which is to contain the powder and balls, is proposed to be made cylindrical, and open at the end, with several touch-holes, this tube is made to fit into a recess or enlargement of the barrel, at the breech part, and when charged, is to be introduced at the breech in different ways, according to the kind of piece to which it is to be adapted.

In applying the contrivance to artillery, the back part or breech of the piece is made to fall down upon a hinge joint, in order to admit the tube to the interior, and when this is done, the breech is to be replaced and secured by bolts or keys. In adapting the tube to muskets and to small arms, the sight at the breech is made to slide back, when a spring throws up the barrel, and the tube with the charges being introduced, the barrel is shut down again, and locked into the stock by a spring bolt under the breech pin.

The tubes are intended each to receive three charges of powder and ball, the first charge of powder and its ball is to be rammed down with wadding made of cloth soaked in tallow and wax, for the purpose of preventing the ignition from communicating when the next charged is fired. The second charge is to be rammed in a similar way, but the third being the outside charge, need not be secured with the same precaution. For loading cannon it is proposed to place discs of lead in the tube between each charge of powder and ball.

It has been before observed, that there are to be several touch-holes in the tube, these are made at such distances apart as shall communicate with the powder of each charge, consequently the charges must be all equal. There are likewise corresponding touch-holes in the external barrel, and locks adapted to each touch-hole. The ignition of the charge is to be by means of percussion, and the lock may be made upon any of the ordinary plans.

The three charges contained in the tube being exploded the end of the breech is to be opened by the contrivances above described, and the empty tube withdrawn, when another tube, previously charged, is to be introduced, and the breech closed. In this way fire-arms of every description may be charged with powder and balls, and fired rapidly, without the interruption of re-loading in the ordinary way.

There are several modifications of the above plan proposed, such as adapting it to double barrelled guns and small arms, but enough has we presume been shewn to render the intentions of the patentee obvious.

[*Inrolled, October* 1825.]

A contrivance very much like a part of the above was made the subject of a patent granted in February, 1825, to Mr. J. Mould. See Vol. XII, page 145.—*Editor.*

To Goldsworthy Gurney, *of Argyle Street, Hanover Square, in the County of Middlesex, Surgeon, for his new Invented apparatus for propelling Carriages on Common Roads, or on Rail-ways.*

[Sealed 14th May, 1825.]

The mode of propelling carriages on roads and railways, proposed by the patentee, is by the agency of moving legs, or crutches, striking out under the carriage, the lower ends of which legs are intended to bear against the ground as a resistance, and being forced backwards by the power of machinery, cause the carriage to move forward in the opposite direction.

Similar contrivances to this has been repeatedly suggested (see Baynes's Pat. Vol. I., and Gordon's Pat. Vol. XI,) the patentee therefore, is to be considered as merely adopting this plan as one that he considers most convenient, and claims as his invention simply the guide rollers attached to the legs, upon which the carriage moves forward.

Plate III, fig. 5, represents the side of the carriage running upon ordinary wheels, with the steam-engine by which its propelling legs, and other mechanism, is to be moved; *a, a*, is the perch or main-beam of the carriage; *b*, the working cylinder of the steam-engine, which in this instance lies nearly horizontal, and is supported in standards upon pivots; *c*, is the piston-rod of the engine, with a small guide-roller running upon the stationary block, *d*. The piston rod is attached by a joint to the vibrating lever *e*, from which lever a chain extends over small pullies, let into the block *d*, and its ends are made fast to the other vibrating lever *f*, consequently, these two levers acquire reciprocating motions from the action of the piston rod.

At the extremity of the cranes neck *g*, two oscillating levers *h, h*, are suspended, and these being respectively attached by connecting rods *i, i*, to the levers *e*, and *f*, move simultaneously with the last mentioned levers as the piston of the engine works to and fro. The lower ends of the levers *h, h*, are attached by joints to the horizontal rods, *k, l*, and these rods are connected to the sliding blocks which move the legs or crutches, *m, n*.

The horizontal rods *k, l*, and also the blocks which carry the legs, slide along in rebated grooves, formed in the under side of the perch *a*, which grooves are represented by dots, and a portion of the side of the perch is removed in the figure to shew one of the blocks *o*, with its rollers within.

The block *o*, has small vertical wheels, or anti-friction rollers, by which it is enabled to run freely along the rebate or ledge of the groove, it has also small horizontal rollers, to prevent the block from rubbing against the sides of the groove. In the under side of each of the blocks, a pin *p*, is fixed, which is intended to pass through the top of the legs *m*, or *n*, and a small helical spring is placed also upon the pin, and secured by a screw nut, for the purpose of keeping up the top of the leg against the under side of the perch, but yet affording it some degree of play.

By the action of the steam engine, and the other mechanism, connected thereto, the blocks *o*, are made to slide reciprocally to and fro, along the grooves of the perch, in the manner above described; and supposing one of the legs or crutches to be brought into the situation of *m*, the foot will take hold of the ground, and remain stationary, while the force of the machinery pressing against it, will cause the carriage to slide forward, and the leg *m*, to assume the situation of *n*; while *n*, will be advanced into the situation of *m*, and *vice versâ*. Thus by the reciprocating movements of the machinery, the carriage will be progressively impelled forward by the crutches or legs.

In order to turn the carriage round corners or angles in the road, the axle of the hinder wheels is made to move round horizontally, upon a central pin, by means of a strap or other contrivance, applied at *q*. By this strap and a suitable handle or lever, the conductor guides the course of the carriage in a straight or curved direction.

The mechanism by which these blocks and legs are to be moved, may be varied in several ways; for instance, in place of the levers above described, endless chains or cords may be employed, passed over pullies, and attached to the blocks instead of the rods *k*, *l*. Other parts of the apparatus may likewise be varied in their details, without effecting the principle.

The patentee sets out the particulars of his invention in the following words, " I claim the use of a roller or rollers, wheel or wheels, to the upper ends of my said propellers, re-acting against a straight and smooth rail or plane affixed under, and being a part of the carriage, such rail or plain being parallel, or nearly so, to the soles or bottoms of the carriage-wheels, whereby the carriage itself is enabled to be rolled over the upper ends of the said propellers, crutches, or feet, by the mechanical power employed."

[*Inrolled November*, 1825.]

To GOLDSWORTHY GURNEY, *of Argyle Street, Hanover Square, in the County of Middlesex, Surgeon, for his Invention of certain Improvements in the Apparatus for Raising or Generating Steam.*

[Sealed 21st October, 1825.]

THESE improvements apply to such descriptions of boilers for steam engines, as contain but a small quantity of water, and where a very considerably extended surface is exposed to the action of the fire, for the purpose of rapidly generating steam.

The patentee has described his improvements to consist in seven particulars: 1st, the employment of wire gauze, to assist in conducting the heat; 2nd, the formation of a boiler of pipes bent in peculiar curves; 3rd, fixing partitions between plates, to form distinct chambers in the boiler; 4th, separating the steam from the boiler, in a vessel placed contiguous; 5th, increasing the intensity of the furnace, and consuming the smoke, by means of a blowing apparatus; 6th, cleaning the inner surface of the boiler from incrustation, by a chemical solvent; and lastly, an apparatus for regularly supplying the boiler with its requisite quantity of water.

The wire gauze is to be cut into narrow strips, and bound round the pipes or tubes, of which the boiler is to be constructed, when the cut ends of the wires presenting themselves to the fire, will conduct the heat to the metal, and cause the steam to be generated within the boiler with great rapidity.

Plate IV, fig. 1, is an end view of the boiler constructed of two series of pipes, bent in the form of the figure 8, two of which pipes only are seen in this view; *a*, is a longitudinal tube extending along the bottom, into which the two series of pipes *b*, and *c*, are inserted, and thence proceeding upwards, cross each other, forming a figure of 8, as above said. The upper ends of these pipes are received into the longitudinal tube *d*, and thus by a great number of similar pipes, being so combined, a tubular vessel is formed, through all the passages of which steam and water is enabled to pass freely.

The fire is placed within the lower elliptical curve of the pipes at *e*, *e*, and a plate of metal is laid along the bottom of the upper elliptical curve for the purpose of separating the upper part from the furnace, and forming it into a flue. The flame heat and vapour from the fire in the lower compartment, passing upwards at the end of the furnace, proceeds along the upper compartment, and thence escapes into the chimney.

The water is supplied to the boiler, by injecting it into the tube *a*, and rises in the series of pipes *b*, and *c*, where becoming boiled by the heat of the furnace within, the steam is forced up into the tube *d*, and proceeds through the pipe *f*, to the engine; but in its way, passes through a tube called a separator, which will be described hereafter.

The ash pit is at *h*, and the whole of the apparatus is enclosed within a double case *i*, *i*, *i*, packed with pulverized charcoal, pumice-stone, or any other imperfect conductor, to prevent the radiation of heat.

A variation in the construction of a tube boiler, is shewn at fig. 2, which is an end view or cross section of the boiler; *a*, is the fire place; *b*, *b*, an elliptical vessel, formed by two plates of metal, bent round one within the other, and producing a ring chamber, which extends the whole length of the boiler. In the upper part of the ring chamber *b*, there is an opening from which pipes *c*, *c*, lead to the semi-circular chamber *d*, made in a similar way to the former, by parallel plates, bent into the form shewn. From the chamber *d*, the pipes *e*, *e*, proceed to another semi-circular chamber *f*, and these by their communication constitute one boiler.

It is proposed, to place a series of vertical partitions in these several chambers, for the purpose of strengthening them. These partitions will stand like ribs round the interior of the chambers, and be secured by screws, there being open spaces at top and bottom to allow of the water flowing freely from end to end.

As a considerable quantity of water will rise with the steam, it is proposed that the steam pipe shall lead, and deliver into a distinct vessel call a separator, shewn in section at fig. 3. In this figure, *a*, *a*, is a cylindrical vessel, made steam and water tight at its joints; *b*, the pipe that conveys the steam from the boiler; *c*, a tube at bottom of the vessel, through which water is conducted to supply the boiler; *d*, is the pipe for the steam to pass from the separator to the eduction aperture of the engine. A vessel *e*, is placed above the separator containing water which is delivered through the pipe *f*, into the lower vessel, and *g*, is a pipe for the passage of steam from the lower vessel to the upper one; *h*, is a trough leading from a reservoir, or any other vessel containing water; *i*, is a cock, through which the water must pass from the trough *h*, to the vessel *e*; and *k*, is another cock intercepting the passages *f*, and *g*, by the former of which, water is admitted from the vessel *e*, into *a*, and by the latter, steam from *a*, into *e*.

The steam and water, intermixed as it comes from the boiler through the pipe *b*, will, on entering the vessel *a*, become separated, the water falling to the bottom by its gravity, and the steam passing off through the pipe *d*, to the engine. The water will descend through the aperture and valve *l*, and through the tube *c*, to the boiler, but, should any sudden effort of the steam in the boiler force it back, the valve *l*, will close upwards, and prevent the water from returning into the vessel *a*.

In order to supply the boiler regularly, with a sufficient quantity of water, the cocks *i*, and *k*, are opened and closed by the reciprocating action of the engine, communicated to the rod *m*, which connects the cranks or handles of the two cocks *i*, and *k*, together. The water will, by these means, be passed from the vessel *e*, into *a*, through the cock *k*, and pipe *f*, the steam at the same time rising at the pipe *g*, into the vessel *e*, for the purpose of giving it vent; but when the level of the water in the lower vessel has risen to the orifice of the pipe *g*, no more steam can pass through that pipe, and of course, the vent being closed, no more water will be discharged from *e*, into *a*, the cocks *i*, and *k*, turning without delivering any, until the level of the water in *a*, has sunk below the orifice of the pipe *g*, when the vent is opened again, and the operation goes on as before.

These modes of separating the steam from the water and of supplying the boiler, which constitute the 4th, and 7th heads of the invention, may be adapted to any other construction of boiler beside those above described.

For the purpose of increasing the intensity of the fire, it is proposed to employ a blowing apparatus of any convenient construction, and to force the blast of air upon the top of the fuel, not into the interior of the fire as usual, by which means the smoke will also be consumed.

In order to cleanse the boilers, that is, remove from their internal surfaces any earthy deposition, or incrustation, it is proposed when the boiler is made of iron, to mix 1 part of muriatic acid, with 100 parts of water, which being retained a sufficient time in the boiler, will dissolve the incrustation; or if the boiler is of copper, take 1 lb of salt, and ½ lb of sulphuric acid, to which add, 3 gallons of water; or, 1 pint of vinegar, to 1 gallon of water. The operation may be considerably assisted by making a small fire under the boiler, and when the dissolution of the earthy matters has been completed, the liquor may be discharged from the boiler by raising the steam, and blowing the contents clean out of the tubes or chambers.

[*Inrolled April,* 1826.]

To William Davis, *of Leeds, in the County of York, and of Charlnford, Gloucestershire, Engineer, for his Invention of certain Improvements in Machinery for reducing or converting Wool into Slivers, or Threads, of any desired length; unlike Worsted, presenting more numerous hair points, projecting from the surface of the Slivers or Threads.*

[Sealed 7th May, 1825.]

These improvements apply to preparing wool, that is carding, roving, and spinning it, and consists in so disposing the machinery, that the ends of the fibres of the wool may be drawn out to the surface of the threads or yarns, in order to produce a more soft and nappy fibre upon the cloth when finished. This exposure of the ends of the wool, is directly opposed to the modes of spinning worsted, as mentioned by the patentee in the title of his patent above, for in preparing worsted it is desirable to cover the ends of the wool, and leave the outside surface of the yarn as smooth and firm as possible.

In the present invention, the wool is proposed to be taken from the carding-engine on to oblique card rollers, in order that its fibres may be turned out of the direction in which they have been previously carded, and by that means crossed, so as to bring the points of the wool forward.

Plate IV, fig. 4, shews a front view of the improved apparatus; fig, 5, is a diagram exhibiting the positions of the parts as they would appear sideways; *a*, is the large cylinder of a carding-engine; *b*, *b*, the smaller cylinders on to the peripheries of which, the filaments of carded wool are delivered from the cylinder *a*. These smaller cylinders have fillets of cards about one inch wide, placed in rings round them, at a short distance apart, the fillets of one cylinder being opposite to the blank spaces of the other, in order that they may both take the wool equally from the large cylinder; *c*, *c*, *c*, are small card rollers, placed obliquely upon spindles, as shewn at fig. 4, which spindles and rollers are turned by bevel geer, and the rollers taking the filaments from the smaller cylinders, turn them by their obliquity, into a different direction to that in which they have been previously laid by the carding engine.

From the card-rollers *c*, the slivers of wool are struck off by the actions of the doffer comb *d*, much in the usual way. The slivers are then conducted through drawing-rollers as at *e*, and are thence passed to the spindles and flyers *f*, to be spun as flax is spun in a mule or jenny.

By this contrivance, the direction of the filaments of the wool, or other material operated upon, are changed from that in which they were first laid, by the rotations of the carding cylinders, and the ends of the wool turned outwards, for the purpose above mentioned, which constitutes the first part of the invention.

The second object of the patentee is to construct an apparatus which shall perform what he calls "a compound drawing and twisting of threads, without stoppage for copping or winding, as in mules or jennys;" which contrivance may be combined with that above described or used separately. It is a sort of sun and planet movement, and is shewn in figs. 6, and 7. These figures give but an imperfect representation of the contrivance, and the description is far from being clear; enough however, may be made out to render the principal part of the patentees intentions evident.

a, is a hollow pulley, to be turned by a band passing round its periphery; *b*, is a hollow axle, passing through the pulley, but not in a straight direction; *c*, is a pulley affixed upon the axle *b*, and which being actuated by a distinct band, turns with its axle with one velocity, while the larger pulley *a*, turns upon the axle *b*, with another velocity. The interior of the pulley *a*, has a hollow ring of small teeth, and upon a bent part of the axle *b*, the toothed pinion *d*, is carried, which takes into this ring of teeth.

The larger pulley *a*, is called the drawing pulley, and is we suppose, to be connected in some way to the drawing rollers; the lesser pulley *c*, is called the twisting pulley. The sliver of wool is carried through the hollow axle, and through small eyes seen in fig. 6. The two pullies are to be turned by riggers and drums, with such different velocities as the intended twist of the roving shall require, and the rotation of the pinion within the hollow pulley, the axle of which carries the eyes that guide the roving, causes the thread or yarn to be spun.

[*Inrolled November,* 1825.]

To JOHN THIN, *of the City of Edinburgh, Architect, for his Invention of a New Method of Constructing a Roasting Jack.*

[Sealed 1st February, 1825.]

THE novelty proposed under this patent consists in placing the flyer of a smoke-jack in such a situation within a chimney, that it shall be made to revolve in a vertical direction instead of horizontal, as heretofore.

Plate IV, fig. 8, is a perspective representation of the apparatus; *a,* is a semi-cylindrical box, intended to be placed in the chimney. It is open on the one side next the flue; *b,* is the flyer or fan-wheel, turning upon a horizontal axle, the half of which fan-wheel is enclosed within the box, and the part that is exposed is intended to be acted upon by the smoke and other vapour which passes up the chimney. At the end of the axle of the fan-wheel, a pinion *c,* is fixed, which takes into a toothed-wheel *d,* and consequently, as the flyer goes round the toothed-wheel turns also. Upon the axle of the wheel *d,* there is a pulley *e,* over which the jack-chain is to pass down to the spit below, and by the revolution of the pulley, the jack or spit, with the meat upon it, is turned in a vertical direction.

The patentee suggests some variation of this plan, viz. by the adaptation of other toothed wheels, to change the direction of the impelling power, and to turn a joint of meat horizontally, as in what are commonly called vertical jacks.

[*Inrolled March*, 1825.]

To George Hunter, *of the City of Edinburgh, late Clothier to His Majesty, for his having Invented and brought to perfection a new Improvement in the construction, use, and application of Wheels.*

[Sealed 5th November, 1825.]

The intention of the inventor by this improvement is to construct a travelling rail-way. The mode of doing which, is certainly very peculiar, and for any thing that we know to the contrary, perfectly new. The ordinary running wheels of a carriage are made to act in circular grooves; that is, the rims or fillets of large wheels are formed with grooves or channels in their inner periphery, and the ordinary wheels of the carriage run in them.

This very extraordinary contrivance is shewn in Plate IV, at fig. 9, which is a side view of a waggon, with the improvements adapted: *a*, *a*, are small running wheels, upon which the waggon advances; *b*, *b*, the circular railways. The periphery of the running wheel *a*, is proposed to be formed with a groove, like a pulley, the circular rail-way *b*, has a raised edge; both of which are shewn a the section, fig. 10.

The peripheries of the circular rail-ways are covered with flat tire, like ordinary wheels, and as the waggon is drawn forward, the rail-ways roll along the road, the running wheels of the waggon bearing upon the raised edges within.

As it may be necessary to confine the circular rail-ways that is, prevent the possibility of their falling over, the patentee proposes to introduce a guard or guide arm, and pulley *c*, and *d*, as at fig. 11, or in some other way to secure the running wheel from slipping off the railway.

A further variation in the plan, is likewise proposed by making the interior of the railway hollow, and forming the periphery of the running wheel with a raised edge corresponding to the hollow.

This plan is proposed to be adopted, not only to waggons, but to any other vehicles of burden, and the wheels and circular rail-way may be made of wood, or metal, or any other material that shall be found desirable.

[*Inrolled, May,* 1826.]

To JOHN DAY, *of the Town of Nottingham, Lace-Manufacturer, and* SAMUEL HALL, *of the same place, Lace-Manufacturer, for their new Invented Improvements on a Pusher, Twist, and Bobbin-Net Machine.*

[Sealed 8th July, 1825.]

IN our Xth Vol. page 181, we have in describing Lingford's patent, for improved machinery for making bobbin net lace, taken occasion to mention the different principles upon which machines for this purpose have been constructed. It is upon one of the plans or principles there mentioned that the improvements of the present patentees are founded, viz. upon the original bolt machine of Kendal and Morley.

This invention consists in adapting the bolt machines of Kendal and Morley, to be worked by pusher bars, instead of the combs of ordinary pusher machines. The mode proposed is, simply by turning the carriage which holds the bobbin, and placing its ears upwards, the bobbin being below the bolt; which is the reverse direction to that in which it was formerly placed. This contrivance allows of the pushers being much shorter, and of consequence, there will be less friction on the threads.

In plate IV, fig. 12, is one of the bobbin carriages, in the position in which it is intended to act; fig. 13, is one of the bolts, to be affixed by a screw to the bolt bar. This bolt is about one third shorter than the bolts heretofore made. Fig. 14, is one of the pushers to be attached by a screw to the pusher bar, this is also about one third shorter than the ordinary pusher.

By this variation in the construction and disposition of the machinery, its operations are simplified, and its work performed with greater certainty, than in the original machines, upon the pusher, or bolt principle; the mode of actuating the improved machine being by means of levers, moved by the hands and feet of the workman as usual.

[*Inrolled January,* 1826.]

To Edward Sheppard, *of Uley, in the County of Gloucester, Clothier, and* Alfred Flint, *of the same place, Engineer, for their new Invented series of Improvements in Machinery for Raising the Wool, or Pile on Woollen or other Cloths, by Points; by which the process is much facilitated, and a great saving effected; and part of which Improvements are also applicable to Brushing, Smoothing, and Dressing such Cloths, to the great benefit of the Public.*

[Sealed 29th March, 1825.]

The first object of the patentees, is to economize the use of teasles employed in raising the pile of cloth, as they consider that by the ordinary mode of using teasles, they are worn out and destroyed, much sooner than they ought to be, and consequently increase the expenses of the manufacturer. Instead, therefore, of setting the teasles in flat frames, and fixing these frames on to the peripheries of large cylinders, as in all the gigging machines hitherto used, (and by which the teasles become crusted or worn on one side), it is proposed to set the teasles in cylinders of small diameter, so that their rotation shall approximate nearer to the figure of the teasel, and consequently bring a greater portion of the surface of the teasel into operation.

There are various modes suggested, of setting the teasels in their frames, one of which is, by means of parallel plates, perforated with holes, through which holes, portions of the teasles are intended to protrude. When one part of each teasel has become worn by use, the confining plate is to be removed, and the positions of all the teasels changed, by the finger and thumb, so as to bring other parts into operation. Small pegs may be set into the periphery of the gig cylinder, and a teasel stuck upon each; or small spindles may be disposed over the surface of the cylinders, their ends being confined between parallel plates, upon which spindles, as axles, the teasels may be respectively mounted, and enabled to turn round. The teasels must, in that case, be set in oblique rows, in order that they may be turned by the transversing of the cloth, which will prevent the cloth from being streaked, by bringing all parts of the teasles into action.

Another object proposed by the patentees, is to enable the teasels which have become spent by use, to be removed from the gig cylinder, and fresh ones introduced in their place, without suspending the operations of the machine. For this purpose, it is intended to adapt several gig cylinders to one machine, and to mount them upon arms extending from a common centre or in rings, or by any other contrivance, so as to bring one cylinder at a time into action, and when that has worked long enough to have exhausted its teasles, then bring the next cylinder into action, by turning the frame; the former cylinder being in a situation to have its teasels replenished ready for future use, without having stopped the movements of the machine.

Between the several cylinders, breast boards, or rollers are to be introduced, for the purpose of regulating the pressure of the cloth upon the gig cylinders, and these are to be made adjustable; they are to have oblique ridges and grooves cut in them, for the purpose of keeping the cloth extended.

Brushing cylinders made with hairs or bristles, are to be placed within the machine, for cleaning the teasels, and other brushing cylinders are also to be adapted to the machine, for laying the pile of the cloth. Heated metal cylinders are to be employed, in connexion with the gig machine, for fixing the nap, and these are to be heated by steam admitted through hollow axles to their interior. Steam boxes are likewise to be employed, for drying the spent teasels.

There are no drawings attached to this specification, by which the intended constructions of the above described apparatus might be pointed out, which is the more to be regretted, as we perceive several features mentioned as claimed, which have been embraced by former patentees, or commonly practised by cloth manufacturers.

[*Inrolled May*, 1825.]

To Chevalier Joseph de Mettemberg, *of Foley Place, in the Parish of St. Mary-le-bone, in the County of Middlesex, Physician; late Surgeon Major in the French Armies; for his Invention of a Vegetable, Mercurial, and Spirituous preparation, which he denominates quintessence, anti-psorique, or Mettemberg's Water, and also a particular method of employing the same, by cutaneous absorption, as a specific, and Medical Cosmetic.*

[Sealed 26th February, 1825.]

The patentee appears, by the commencement of his specification, to be particularly desirous of impressing upon the public, that he is no Quack! and therefore calls the attention of his readers to the following important circumstances:—1st, that he is a regular and legitimate professor of medicine, having been raised to the rank of a

Physician and Surgeon of the first class in the French Army, by especial direction of the Government, on 13th January, 1804; 2nd, that the invention which forms the subject of the present patent, was called forth at the earnest desire of the French Government in 1794; 3rd. that he, the inventor, obtained public reparation for several libellous and calumnious papers written against him, and his invention, by sentence of the Correctional Tribunal of Paris 1st August, 1821; and, lastly, that "men's passions do not reason in the infancy of useful discoveries."

The subjects of the patent are, first a peculiar mode of mixing mercury with other matters, to be applied to the human system by absorption; secondly, the manner of applying the same, which is, by washing, and by friction. This medicine is stated to be much more safe, efficacious, and convenient for the prevention, detection, and cure of certain diseases, than any other external application of mercury, or sulphurous ointments, or any mercurial preparations taken inwardly.

The compound is made by mixing the materials in the following proportions. Dento chlorite of mercury or corrosive sublimate half a dram; distilled water, or any other water that is tolerably pure, fourteen ounces; vegetable spirituous infusion two ounces; alcohol highly rectified a quarter of a dram.

The vegetable infusion is made by immersing in full proof brandy, the dried leaves of worm-wood, sage, wild mint, thyme, lavender, cammomile or elder, with dried roots of the male fern, of each about two ounces; which are to be digested cold for about twelve or fifteen days. The mineral substance is to be pounded in a glass mortar, and being dissolved by the aqueous and spirituous solvents, the mixture is then to be securely corked up in a glass bottle ready for use. The compound when so prepared, is not poisonous.

In using Mettemberg's water, the bottle having been well shaken, a small quantity is to be poured out into a glass, and the arms and legs washed with it all over by means of a sponge, the patient being in a warm room. The operation is recommended to be performed before going to bed; any time of the day will do. After the wash has been on sufficient time to have partly dried upon the skin, it is to be rubbed with the hand, in order to promote cutaneous absorption.

Using this wash once per day will be sufficient to kill the most inveterate disease, the quantity of mercury required to be absorbed being not more than one grain per day, and when employed as a preventive to contagion, one twentieth part of a grain per day is sufficient.

The patentee expatiates very copiously upon the advantages of this new invented medicine, shewing its effects in a great variety of situations as well as the conveniences which it affords compared to other medicines employed for the same purpose; the particulars of which for obvious reasons need not be repeated here.

[*Inrolled April,* 1825.]

Original Communications.

On the Explosion of Steam Boilers. By Jacob Perkins.

It has been generally considered a well established fact, that the caloric of steam, at a given elasticity, is invariably the same when in contact with water; but this is far from being the case. It may be, and often is, so generated as to indicate very high degrees of temperature, without a corresponding increase of power, so as evidently to prove that temperature alone cannot be relied on as a measure of the elastic power of steam. Many experimentalists have thus undoubtedly been led into error, especially in reference to high temperatures. If any part of the boiler which contains the steam be suffered to become of a higher temperature than the water contained in it, from want of a sufficient supply, the steam will readily receive an excess of caloric, and become supercharged with it, without acquiring proportional elasticity. In some recent experiments I have heated steam to a temperature that would have given all the power that the highest steam is capable of exerting, which would have been 56,000 pounds to the square inch, if it had had its full quantum of water; yet the indicator showed a pressure of less than five atmospheres. Having satisfied myself, by repeated experiments, as to the certainty of this curious fact, the thought struck me, that if heated water were suddenly injected into the superheated steam, the effect would instantly be the formation of highly elastic steam; the strength of which would depend upon the temperature and quantity of the supercharged steam, and of the water injected. To ascertain the truth of this theory, I made the following experiments.

A generator was filled with water and heated to about 500 degrees, and, consequently, exerting a force of about 50 atmospheres; but the pressure valve being loaded to about 60 atmospheres, it prevented the water from expanding into steam. The receiver, which was destitute of both water and steam, was heated to about 1200 degrees: a small quantity of water was injected into the generator by the forcing pump, which forced out from under the pressure valve into the receiver, a corresponding quantity of heated water, and this instantly flashed into steam; which, from its having ignited the hemp cord, that covered the steam-pipe ten feet from the generator, must have been at a temperature of at least 800 degrees, which would be equal to about 800 atmospheres; but from want of water to give it its necessary density, the indicator showed a pressure of about 5 atmospheres. Whether the pressure of the steam, which was rushing through the steam-pipe, was at 5 or 100, or more atmospheres, the steam-pipe kept up at the high temperature before mentioned, which I attributed to the steam being supercharged with caloric. The pump was now made to inject a much larger quantity of heated water, and the indicator showed a pressure of from 50 to 80 atmospheres; it soon expanded, the throttle valve being partly opened, to the former pressure of about 5 atmospheres. The water was then injected again and again, and the indicator was observed to oscillate at each stroke of the pump, from 5, to between 40, and 108 atmospheres, according to the quantity of water injected; clearly showing that, at this reduced pressure, there was a great redundancy of heat, with little elastic force. It soon occurred to me, that to this might be traced the true cause of the tremendous explosions that suddenly take place in low as well as high pressure boilers.

There are many instances where immediately before one of these terrific explosions had taken place, the engine laboured; showing evidently a decrease of power in the engine. To illustrate the theory of sudden explosions, let us suppose the feed pipe or pump to be choked; in this case the water would soon sink below some parts of the boiler, which should be constantly covered by it, thus causing them to become heated to a much higher temperature than the water. The steam now being in contact with the heated metal, readily takes up the heat and becomes supercharged with it (*a*). Since caloric will not *descend* in water, it cannot be taken up, by the water which is below it. The steam thus supercharged, will heat the upper surface of the boiler in some cases *red-hot* (*b*), and will ignite coals or any other combustible matter

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(*a*) Practical engineers have frequently witnessed the destruction of the packing of pistons, by their becoming charred, although the steam issuing was in contact with the water, the temperature of which did not exceed 230 degrees. It is very evident that this steam was surcharged with heat, and was much above the temperature of the water upon which it was reposing, and in a suitable state to produce explosion, had the water been allowed to rise with the steam, by drawing it off faster than it was generated.

(*b*) Mr. Moyle, a practical engineer from Cornwall, gave me the following interesting fact:

On going into his boiler-room, he observed a ladder, the foot of which rested on the top of his boiler, to be in flames: he instantly ascertained that the top of the boiler, from some cause which he was then unable to determine had become *red-hot*; with all possible promptitude he ordered the fire to be quenched, which probably saved his premises, and perhaps his life. Mr. Moyle, which may be in contact with it. If the water which is kept below the supercharged steam by the pressure of it should by any circumstance be made to take up the excess of caloric in the steam, as well as that from the upper part of the boiler, which has become heated above the temperature of the water, in consequence of the water having been allowed to get too low, it will instantly become highly elastic steam, and an explosion cannot be prevented by any safety valve hitherto used. To show how the water may be suddenly brought in contact with the over-heated parts of the boiler, as well as with the supercharged steam, it will be necessary to state the following facts.

As long as water is not heated above 212 degrees it will

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found, upon examining the boiler when cold, that very little water remained in it.

The following similar fact to that mentioned above has been recently communicated to me by Mr. Williams, principal manager of the Dublin and Liverpool Steam Company:—He was alarmed in the night time, during one of his passages from Ireland to Liverpool, by the strong smell of burning pine, which, after a diligent search, he found to proceed from a pine block which had been accidently thrown on the top of the boiler, and which was discovered to be on fire.

A stronger case still, was that of an explosion at the iron-foundry at Pittsburgh, North America. As is the practice in North America, a high pressure engine of sixty or eighty horse-power was supplied with steam from three separate cylindrical boilers, each being thirty inches diameter, and eighteen feet long. One of these boilers had for some time been observed to be getting red-hot; but as the other two supplied a sufficiency of steam for the work then doing, it was disregarded, until it exploded. The main body of the boiler separated from one of its ends, at an angle of 45 degrees, and passed off like a rocket through the roof of the building, and landed about 600 feet from it.

simply boil and give off atmospheric steam, without the water having any tendency to rise with it; but as it becomes more and more elevated in temperature, its disposition to rise with the steam becomes more and more apparent. As the steam presses on the surface of the water in the same ratio as the water increases in temperature, it only boils without rising, as when at atmospheric pressure; but if the steam should be drawn off faster than it is generated, this artificial pressure would be taken off, and the water would rise with the steam in proportion to the suddenness and rapidity of its escape. The water and steam in this mixed state, thus filling every part of the boiler, the excess of caloric in the supercharged steam, as well as the extra heat from the boiler, will be instantly taken up by the water which rises with the steam, by which means the steam becomes sufficiently dense (or powerful) to produce the fatal effects too often experienced, not only from high but from low pressure boilers. If, for instance, the water (as has before been noticed) which is exposed to the fire, should be suffered to get below any part of the boiler, the steam will soon become supercharged with heat. If a boiler thus circumstanced should have the weight taken from the safety valve (c), or a small rent effected in the boiler from its giving way by the pressure of the steam, an explosion will be sure to follow. A remedy for this kind of explosion which appears to be the only serious one, is that of not allowing the water to subside below any part of the boiler which is exposed to the fire. In case the water should settle, it may be known by having a tube, with its upper end trumpet-mouthed, and its lower end fixed in the boiler, entering a few inches below the surface of the water; then, as soon as it subsides sufficiently to allow the steam to blow off, the blast will give warning that no time should be lost in supplying water, or checking the fire (d). When highly supercharged steam is rushing from the safety valve or any other aperture, it may be

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(c) It was stated in evidence at the coroner's inquest taken at the Humber, in the case of an explosion on board of the Graham steam boat, that just before the explosion took place twenty pounds were taken off the safety valve. Now if the steam in this boiler had been properly generated, the relief given to the safety valve could not have produced explosion; but if the water had got low in the boiler (as was probably the case), and the steam supercharged with heat, the ready way to produce explosion was to allow the steam to escape faster than it was generating, when

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kept in the lower part of the boiler by the pressure of the confined steam.

Several instances have occurred when there has been sufficient warning, by the rushing of the steam from a rent or fracture, for the bystanders to escape from injury, before the explosion took place. There has been at least one case, where the boiler was raised from its bed into the air, by the force of the steam issuing from the rent (upon the principle of the rocket,) before the water had sufficiently expanded by the removal of the steam, caused by the rent or fracture, to take up the heat of the boiler, and the supercharged steam; when an explosion took place after the boiler had been raised many feet in the atmosphere, and separated with a very great report, one part rising still higher, while the other dashed with great force on the ground. It is, I believe, a fact, that more persons have been killed by *low* than by high pressure boilers.

It is but about twelve months since sixteen persons were killed by the bursting of a low pressure boiler in Flintshire. High pressure boilers have since been substituted. Some of the most dreadful accidents from explosions which have taken place in America, have occurred from low pressure boilers.

(d) This will apply only to low pressure boilers, on account of the height of the column which would be required to balance the pressure of the steam. The high pressure engines, as used in known by its perfect invisibility, even in the coldest day, nor can it be seen at any distance from the valve or cock; it is, however condensible as may be seen by holding any cold substance in its range.

Novel Inventions.

Perkins's Improved Steam Engine.

This important invention, respecting which, such conflicting opinions have been long entertained, appears to be now assuming a shape that will very shortly determine the points of controversy, (viz), the question of the perfect safety of the engine; its actual power; and the great economy of fuel.

Mr. Perkins's last patent has passed the Great Seal, his recent improvements may therefore with safety be now mentioned. The mechanical difficulties against which he has had to contend in controuling and applying the tremendous power of high pressure steam, has not only absorbed much more time than he anticipated, but also a greater outlay of money.

The newly constructed engine to which we have adverted in our preceding number, has been at work for some

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Cornwall, would require a column varying from 60 to 120 feet; and the new high pressure safety engine, now coming before the public, would require a column more than four times as high as St. Paul's cross to balance the steam.

days, apparently very much to the satisfaction of the few engineers who have seen it. We have been repeatedly present during its performance, and studiously considered its operations, in which we have not been able to detect any fallacy. As however, we do not mean at present to pledge ourselves as to any definite power which the engine is capable of exerting, we shall simply state the manner in which a certain power has been demonstrated in our presence, leaving our readers to draw their own conclusions from the facts set forth.

The fly-wheel is eight feet in diameter, and the steam working as we are informed, at a pressure of twenty-seven atmospheres, caused the piston to perform sixty strokes per minute. The periphery of the fly-wheel being pressed upon by a loaded lever, (called in mechanics,) of the *third order*. The power exerted by the engine at that time, may be known by calculating the amount of force or friction acting upon the fly-wheel.

The lever was a wooden bar, about four inches square, bearing upon the periphery of the wheel at the top. The shorter arm of the lever, or distance from the fulcruum to the impinging point, where the pressure acted upon the wheel was fourteen inches; for thence to the end, that is the longer arm of the lever was ninety inches. To the extremity of the lever was suspended a weight, making with that of the bar, rather more than one hundred and fifty pounds. From this may be known the actual force overcome, or work done by the engine at that time. By the addition of fifty pounds weight to the end of the lever, the engine laboured, but still worked steadily; by the removal of part of the weight, the speed of the engine became nearly doubled.

The steam, it was said, acted under a pressure of twenty-seven atmospheres, but Mr. P. states, that he usually employs a pressure of fifty-six atmospheres, and that the consumption of coal per hour, is about half a bushel.

Under this pressure of about 800lb. upon the inch, the steam is admitted into the working cylinder, and when the piston has descended through one eighth of its stroke, the ingress of steam is shut off, and the other seven eights of the stroke is performed by expansion.

As Mr. Perkins's original idea of substituting pressure for surface, in generating steam (which appears to be the basis of his invention) has never for a moment been abandoned, the invention if satisfactorily established must certainly be considered as of the utmost importance, particularly its first feature ABSOLUTE SAFETY, which could hardly have been contemplated in any other plan of boiler, to the extent which this construction evidently exhibits the capability of effecting. From the mode of constructing the compound generator as now adopted, it becomes a safety valve of itself. For the pressure is divided into so many compartments, that any one of them may explode with impunity, without even disturbing a brick of the furnace. Although in the early part of the invention many explosions took place, without any accident attendant (which served to shew the safety of this method of generating steam, as well as to point out the proper way of constructing the generators) yet for the last two years it is said that nothing of the kind has taken place, notwithstanding the steam has been frequently raised to a pressure of above 1500 lbs. to the square inch.

To illustrate the safety of this method of generating steam, let us imagine a few tuns of gunpowder to be confined within one compartment, and if ignited the tremendous effect will be readily anticipated; but let this same quantity of powder be divided into a proper number of compartments, and any one conversant with fire works would not hesitate to explode it with a match, of not more than a few inches in length. We should not have dwelt so long on this part of the invention, had not the alarm, from the great number of explosions within the last year or two, not only in this country, but France and America, created universal terror; particularly in steam-boat travelling; and the danger of explosion would still be more alarming, since it has been recently discovered [that the safety valve is of no use, when an explosion takes place from the sudden generation of steam.*

We will now mention some of the practical difficulties which Mr. P. has had to contend with. Frst, the re-action of this highly elastic steam on the eduction side of the piston, occasioned by its density, and expansive property. Second, by the uncreated friction occasioned by the great pressure on the valves. Third, the carbonisation of the lubricating material whether tallow, oil, or other fat, which was used for the piston and valves. Fourth, the difficulty of preventing the steam from becoming surcharged with caloric, which at times would be at such an excess, as to melt the joint packings, and heat the steam-pipe red hot.

The first mentioned difficulty is removed by a very novel method, by which the eduction pipe and valve are dispensed with. At the end of the stroke the metallic piston enters an enlargement at that part of the cylinder, and passes three quarters of an inch below it, leaving sufficient space for the steam to flash out at the dead point, into a tube leading to the chimney, at which instant the vacuum valve closes, and shuts off seven eighths of the steam, which escapes up the chimney, and the other eighth under the piston, is easily condensed by a spray of water, which is afterward used for generating the steam. At the next, puff the condensed steam, water, and air, is thrown out, and the heated water runs into the cistern of the pump, from whence it is forced into the generator, dispensing with the complicated and expensive air-pump, as well as condensing water.

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* The paper on the Explosion of Steam Boilers, in another part of this number, will satisfactorily explain the true cause of this kind of explosions, which we believe was never before suspected.

The second difficulty is removed by rendering the employment of an eduction valve unnecessary; for the induction valve requires to be only one thousandeth part of the aeria of the cylinder; the power required therefore to lift it (if the valve was not so constructed as to neutralize the pressure) would be very little.

The third difficulty, which was a very serious one, when the temperature of the steam employed was five hundred pounds upon the inch, is removed by using a metallic piston, made of a peculiar alloy, requiring no lubrication whatever; since it glazes by its working. And as for the valves there is only one little simple lifting induction valve, and that being destitute of friction, requires of course no oil.

Fourth preventing the steam from becoming surcharged with coloric. Upon this important part of Mr. P's. invention we are restrained, for certain reasons at present, from explaining, it is however accomplished, and will be made known when the specification of the last Patent is inrolled.

We understand that Mr. P. has taken some orders for his high pressure safety engines, and guarantees the saving of half the fuel commonly used, for a given power, the weight not to exceed one-third of ordinary condensing engines, and not to occupy more than one-third the bulk: with absolute security from the dangerous effects of explosion.

Etching on Ivory. *By* Mr. Cathery, *of Hyde Street, Bloomsbury.*

The usual mode of ornamenting ivory in black, is to engrave the pattern or design, and then to fill up the cavities thus produced with hard black varnish. The demand for engraved ivory in ornamental inlaying, and for other purposes, is considerable, although the price paid for it is not such as to encourage artists of much ability to devote themselves to this work, which, consequently is trivial in design and coarse in execution. Mr. Catheryes improvement consists in covering the ivory with engraver's varnish, and drawing the design with an etching needle; he then pours on a menstruum composed of one hundred and twenty grains of fine silver, dissolved in one ounce measure of nitric acid, and then diluted with one quart of pure distilled water. After half an hour, more or less, according to the required depth of tint, the liquor is to be poured off, and the surface is to be washed with distilled water, and dried with blotting paper; it is then to be exposed to the light for an hour, after which the varnish may be removed by means of oil of turpentine. The design will now appear permanently impressed on the ivory, and of a black or blackish brown colour, which will come to its full tint after exposure for a day or two to the light.

The property which nitrate of silver possesses, of giving a permanent dark stain to ivory and many other substances, has long been known; but Mr. Cathery has the merit of having advantageously applied it in a department of art in which it is likely to be of considerable service by improving the quality of the ornament, and at the same time of diminishing the cost. Varieties of colour may also be given by substituting the salts of gold, platina, copper, &c. for the solution of silver.

[The Society of Arts have voted to Mr. Cathery, the sum of five guineas for this invention.]

Imitation of Gold.

M. Dittmer has shown in the Hanoverian Magazine that the following mixture, compounded by the privy counsellor Doctor Hermstadt, may be substituted for gold, not only with respect to colour, but also to specific gravity, density and ductility:—16 loth (less than 8 French ounces) of virgin platina, 7 loth of copper, and 1 loth of zinc, equally pure: place these metals together in a crucible, cover them with powdered charcoal, and melt them completely into a single mass.—*Rev. Encyc.*

Printing from Zinc.

At the bookstore of Leake, at Darmstadt, has appeared the first great work whose prints are taken from plates of zinc. It is a collection of architectural monuments which will consist of twenty numbers. The drawings are made upon zinc as upon stone, and the expense of engraving is thus avoided, The editor is in consequence able to sell each number containing twelve folio plates, at five francs upon common paper. In an economical point of view. this process deserves to be recommended.—*Bulletin Univ.*

Polytechnic and Scientific Intelligence.

Tunnel under the Thames.

Mr. Brunel's great undertaking of forming an excavated road-way under the Thames, from Rotherhithe to Wapping, has now proceeded so far as to leave no doubt of its successful prosecution, and ultimate completion. The work has advanced under the bed of the River more than five hundred feet from the perpendicular shaft, and as the masonry is fixed as fast as the excavation is made, the construction of the tunnel may be said to be so far complete.

The proprietors anxious to gratify the public curiosity, have thrown the works open to public inspection for a few days, the passages being illuminated by gas, and the ground strewed with gravel; and it is astonishing to see what an immense number of persons daily resort there.

The tunnel is formed into two ellipticala venues, which communicate with each other by a number of lateral arches. There is a carriage way, and a raised foot-way in each avenue, and the vehicles proceeding from the London side of the River, are intended to pass along one avenue, while those from the Surrey side towards London are to proceed along the other avenue: by this arrangement, all confusion by stoppages, will be avoided.

We intend shortly to lay before our readers, the particulars of this extraordinary undertaking, accompanied with a description of the manner in which the work is carried on. The bold and singular attempt of constructing a roadway under such a majestic river as the Thames, must be the effort of a master genius; and considering the many practical difficulties that necessarily present themselves at every step of progress, we cannot but consider this, as the greatest work of modern times.

Canal through the Isthmus of Panama.

The government of Guatemala has granted to A. H. Palmer, esq. and others of the city of New York, the right to open a direct canal communication for ships, from the Atlantic, to the Pacific ocean, through the river San Juan, and the lake Nicaragua, with the privilege of an exclusive navigation for twenty years. This important grant was obtained recently, from the government of Guatemala, through the presence of col. Williams, our minister, by Col. De Beneski, agent for the company, who arrived in this country early in the present month, after having accomplished his purpose: and who was recently in this city.

The whole extent of excavation, we are informed, will not exceed 17 miles (the distance between the lake and the river,) which will require a lockage of 200 feet. The work is required to be completed in 18 months, and it is said will be commenced with 6000 men fom this country. An attempt will be made (and doubtless a successful one) to obtain an act of incorporation of the legislature of this state. The style of the company is the Atlantic and Pacific Ocean Company.

The agent of an English company was desirous to obtain the grant, or to participate in the advantage of it, and offered a large bonus for the privilege; but it is a source of gratification that the enterprise, skill and means of our own countrymen, have been charged with the execution of this truly great undertaking. It can scarcely fail to be a source of wealth to the company, and advantage to the whole commercial world.

The Boston Daily Advertiser, states that Col. De Beneski, waited on the President, at Quincy, with despatches from our commercial agent at Guatemala, authenticating the intelligence communicated in the foregoing article. The government of Central America, called for proposals for such an undertaking about a year since, and several companies have been formed, it is said, in Europe for the purpose, and have presented their claims. The company with whom the contract is now made, are to have the right of toll, and certain exclusive privileges, which the persons interested think of great value. It is supposed that the undertaking will receive countenance from the government of the United States. The persons now composing the company in New York, propose to extend it through all parts of the Union, making it as much as possible a national concern, and will apply to Congress, it is said, for incorporation, by the name of "*The Central American and United States Atlantic and Pacific Junction Canal Company,*" with a capital of $5,000,000.—The undertakers are very sanguine as to the practicability of the scheme, and the profit of the speculation, as well as the national and commercial advantages to be derived from its execution. We understand they mean shortly to solicit the co-operation of our capitalists, and exhibit a detailed exposition of their views.

French Patents

GRANTED IN OCTOBER, NOVEMBER, AND DECEMBER, 1826.

Stock, Samuel, Paris, for a process to print or paint on both sides of silks, cottons, &c.—10 years.

Nichols, J. B. P. Paris, for an apparatus to cool beer.—10 years.

Debezis, P. J. Paris, for a distilling apparatus.—10 years.

Cambaceres, J. A. Paris, for the use of Stenric acids, in the fabrication of oxyginated wax lights.—15 years.

Frank, S. Amsterdam, for a blacking called the *cordova lustre.*—5 years.

Lemoine and Meurice, Messrs. Paris, for a machine for mixing colours.—15 years.

Allnand, Brothers, Limoges, for a method of grinding by water, to reduce into an impalpable powder, and convert into paste or enamel, all flinty, earthy, and other metallic oxyde substances. —10 years.

Joly, R. M. Paris, for water-proof boots and shoes.—5 years.

Lebourlier, F. P. Paris, for a method of taking off the husk of black pepper, and whitening it.—5 years.

Laborde, J. Paris, for a mechanical apparatus for evaporating, concentrating, thickening and clarifying liquids, or all liquified substances.—5 years.

Bereche, C. E. M. Paris, for a lighter steam-boat, than those hitherto built.—15 years.

Gensoule, A. B. Bagnols, for a method of heating the pans, for winding off silk from the balls, with economy of fuel.—10 years.

Berard, S. and Wilkinson, J. for a bobbin and its carriage for spinning, lengthening, and twisting raw silk, flax, hemp, wool, cotton, and such like.—15 years.

Arnut, P. Rochefort, for an economical chimney, free from smoking, and for a machine for sweeping chimneys.—5 years.

Rivaux, A. Lyon, for a weaver's shuttle, in which the cane experiences a retrograde motion every time it is thrown, by which the portion of woof over-wound, returns upon the cane.—5 years.

Davenne, L. D. Paris, for a moveable cushion for billiard tables. —15 years.

Masnyac, P. Lyon, for a method of preparing hats with chickens feathers.—5 years.

Kinkelin, P. E. Paris, for a system of inland navigation, upon an uninterrupted anchorage.—15 years.

Maniclor, N. H. London, for the preparation called *vaxeme,* for making wax lights.—15 years.

Rodier, D. Nimes, for a method of producing all kinds of figures on silks, wool, cottons, &c.—15 years.

Nicholson, J. Lille, for a new method of working bobbins, tubes and other instruments, used in the preparation and spinning or twisting of all fibrous substances.—15 years.

Walker, J. Paris, for making braces, girdles, and elastic garters, with double covered springs.—15 years.

Dietz, J. C. Paris, for a steam engine and water pump, with metallic and elastic pistons, adapted to be used instead of horses, and to serve to propel vessels ascending canals and rivers, and applicable to the draining of marshes —5 years.

Dobree, T. Nantes, for the fabrication of felt for sheathing vessels.—15 years.

Werdet, the father, and Miss M. E. Werdet, Paris, for a method of writing straight without lines.—5 years.

Battendier, M. Paris, for an expanding leather trunk—5 years.

Berolla, A. F. Paris, for a pendulum, consisting of a figure which swings backwards and forwards, instead of from left to right. —5 years.

Bart, J. A. and Dorleans, E. Paris, for an improvement in making optical glasses.—10 years.

Charoy, N. Paris, for a machine called the spinner's guide, adapted to the mule jenneys—5 years.

Laignel, J. B. B. Lyon, for a system of navigation on rapid rivers—15 years.

Lelyon, J. P. Versailles, for a carbine, with four charges, having only one barrel, and which may be used as a fowling piece, by employing a different barrel—5 years.

Zuber, J. and Co. Rixheim, near Mulhouse, for a method of printing with engraved hollow rollers, instead of by the present method—10 years.

Godart, J. B. Amiens, for a machine for combing wool, &c.—15 years.

Neale, J. Cernay, for a double pressure steam-engine—5 years.

Frederic, C. and his wife, Mrs. J. M. Gagnoux, Grenoble; for a loom for making nets with fixed square meshes—15 years.

Galy-Cazalat, A. and Dubain, Capt. for an impelling power without machinery, to be used instead of steam in merchant vessels, and for its application to a fire-ship which will not sink—10 years.

Cessier, Mr. Paris; for improvements in Pauly's guns, having piston and *bascule*—5 years.

Froment, A. J. Lille, and Mrs L. B. Beaugnon, his wife, Paris; for a compound mastich, for taking impressions of oil and water colour paintings, on linen, paper, wood, metals and stone, also for a new process of copper plate printing, and for gilding or washing with silver without using mercury or fire; and for a machine for printing large pictures—10 years.

Dubost, B. J. Lyon; for a combination of steam engines, and the use of horses, in towing craft up rivers, &c.—15 years.

Wilks, J. B. London; for improvements in the evaporation of water for steam engines, and other uses—15 years.

Pape, J. H. Paris; for an improved piano, with a cast sounding board, and a new disposition of the hammers—10 years.

Roth, L. Sceaux-Penthievre; for a system of distilling in a vacuum, with or without fuel.

Cristofle, J. Paris; for a new method of making horn or ergot buttons—5 years.

Chevandier, Paris; for a furnace in which small coal may be used, for drying wood, for the use of glass founders—5 years.

Joarhit, P. St. Etienne; for an apparatus for taking off the glass from cloths, &c. by steam—5 years.

Fournier, Miss F. P. Paris; for improvements in children's whalebone pads and rollers—5 years.

Tastemain, P. N. Senonches; for a reaping machine—15 years.

Malbec, A. Paris; for a method of preparing the extract of milk, or milk for travelling—5 years.

Coiffier, H. P. Lyon; for a gilt alphabet of different materials and dimensions, for sign-boards, either on wood or glass, instead of the usual method of painting—10 years.

Middendorp, M. Paris; for an improved printing machine—5 years.

Chaussonnet, P. A. M. Paris; for a method of making metal buttons in imitation of silk—5 years.

Gregoire, senr. and H. L. Gregoire, junr. Nimes, for a process and machine adapted to the machinery of jacquard, for making figured tulle and blond-lace.

Simonard, V. L. F. Lyon; for a machine for ascending rivers by the effect of the current—15 years.

Lequart, Paris; for mouldings in brass upon wood, for mirror frames, shop-fronts, &c.—10 years.

Leriche, M. J. Paris; for the application of the machine used by the ancients, called *catapulle,* for extracting, clearing and levelling land—10 years.

Galy-Cazalat, Paris; for an aerostatic lamp and candlestick, with a match and two combustibles—10 years.

Bouchy, J. V. Paris; for a machine to manufacture Paris sprigs or points—15 years.

Avril, M. Paris; for a three wheeled carriage, called a *triolet*—5 years.

Perpigna, A. Paris; for an improved method of evaporising water —15 years.

Delamare, J. P. senr. Rouen; for improvements in the fabrication of orange mineral—10 years.

Lacote, P. R. and Carulli, F. Paris; for the invention of a guitar with ten strings, called the *decacorde*—5 years.

Paturle, Lupin and Co. and Seydoux, C. and A. Paris; for a machine called *vaudoise*, for combing wool—15 years.

Cordier, and Daulle, Messrs. Paris; for a wool combing machine —5 years.

Brierq, P. Lyon; for a stuff to be used instead of furs, of various patterns, called *brierque*, and for his processes for dyeing stuffs —5 years.

Gounon, E. Eause; for a continued distilling apparatus by steam —15 years.

Corout, A. St. Julien-Molin-Molette; for a loom for weaving silk, cotton, wool, &c.—10 years.

Croisat, F. Paris; for a process of making flowers in hair and silk —5 years.

Hall, E. Paris; for a new fulling machine—10 years.

Benoist, Mrs. Paris; for a close stool with an absorbing cover, for water closets—10 years.

Stuckens, P. G. Paris; for an improvement in the French horn— 5 years.

L'Epine, M. Paris; for a gas generating lamp, called the *Gazo-lampo*—10 years.

Largaier, P. St. Roman; for a new application of steam for heating the water used in silk spinning—5 years.

Joseph, S. London; for a new machinery to be adopted to screw presses, to increase their force—5 years.

Poole, M. London; for a method of tanning hides, by employing the pressure of the atmospheric air—15 years.

Wilks, J. B. London; for improvements in the evaporization of water destined for steam engines, &c.—15 years.

Pape, Mr. Paris; for a machine for piercing wood for veneering, and for turning the feet and bases of pianos, and other furniture—10 years.

Berard, P. Lunel; for an apparatus for essaying the spirit of wine—5 years.

Debergue, L. N. Paris; for a recipient for transporting gas—15 years.

Poulliot, J. J. Paris; for a pneumatic regulator applicable to hydrogen gas apparatus, and fire machines—5 years.

Leprince and Poulain, Messrs. Paris; for improvements in a cotton flatting mill—5 years.

Hemtault, E. Paris; for a circular drag and appendages— 10 years.

Galy-Cazalat, A. Perpignan; for the invention of a percussion gun, and cartridge case complete—10 years.

New Patents Sealed 1827.

To Joseph Frederick Ledsam, of Birmingham, in the county of Warwick, merchant, for his having invented an improvement for purifying coal gas, by means not hitherto used for that purpose—Sealed 2nd March—6 months.

To Nathan Lucas, and Henry Ewbank, both of Mincing lane, in the city of London, merchants, for their having invented an improved process to be used in the dressing of paddy, or rough rice—10th March—2 months.

To Lemuel Wellman Wright, of Upper Kennington lane, in the county of Surrey, engineer, for his having invented certain improvements in the combination and arrangement of machinery for making metal screws—17th March—6 months.

To Benjamin Rotch, of Furnival's Inn, in the city of London, esq. for his having invented a diagonal press, for transferring perpendicular to lateral pressure—22nd March—6 months.

To James Stewart, of Store street, Bedford square, in the county of Middlesex, piano-forte maker, for his having invented certain improvements on piano-fortes, and the mode of stringing the same—22nd March—6 months.

To James Woodman, of Piccadilly, in the county of Middlesex, perfumer, for his having invented improvements on shaving and other brushes, which improvements are also applicable to other purposes—22nd March—6 months.

To Jacob Perkins, of Fleet street, in the city of London engineer, for his having invented certain improvements in the construction of steam engines—22nd March—6 months.

METEOROLOGICAL JOURNAL, February and March, 1827.

1827.	Thermo. Max	Thermo. Min.	Barometer, Morn.	Barometer, Even.	Wind.	Weather.
Feb.						
24	40	25	29,78	29,88	W—S.W—N.W	Fair—clear—slight frost
25	41	23	29,95	29,83	S.	Ditto—cloudy—ditto
26	49	35	29,65	29,50	S.—S. W.	Thaw—high wind
27	54	36	29,32	29,58	W—S.W—N.W	Ditto—ditto
28	50	35	29,53	29,83	E.—S. W.	Rain } 1 ½ in. wind
Mar.						
1	58	45	[illegible]	29,47	W.—N. W.	Ditto
2	42	34	29,14	29,33	S.—N. W.—N.	Ditto & snow
3	48	40	29,19	28,83	W.—S. W.	Cloudy—showers—ditto
4	52	34	28,70	29,11	W.—N.W.—N.	Stormy—hi. wind—hail & ra. } [illegible] in
5	44	32	29,55	29,03	N.W—W—S.W	Ditto—ditto—ditto
6	50	41	28,78	29,02	S. W.—W.	Ditto—ditto—rain } ¼ in.
7	49	37	29,35	28,85	S.—S.W.	Ditto—ditto—ditto
8	48	34	28,70	29,04	S.W.—N—N.W	Cloudy—wind—showers
9	44	28	29,33	29,37	N. W.—N. E.	Ditto—fair—frost
10	48	28	29,60	29,51	N. E.—S. W.	Fair—ditto
11	55	44	29,35	29,30	S. W.	Rain 7-16 in.
12	54	44	29,43	29,61	N. W.	Fair—clear
13	56	45	29,20	29,41	W.—S. W.	Ditto morning—wind & rain night
14	49	40	29,53	29,68	W.	Fair—high wind
15	50	35	29,44	29,66	N. W.—N.	Stormy—do. thun.—ha. & ra. ⅛ in.
16	47	34	29,90	29,53	N.W—W—S.W	Cloudy—wind and rain do.
17	45	37	29,33	29,62	N.	Very high wind—ditto do.
18	43	32	29,80	30,03	N.	Ditto—fair
19	43	32	30,07	30,04	N.—S. W.	Cloudy—slight rain } 1-20 in.
20	53	44	29,99	29,94	S. W.—W.	Ditto—ditto
21	52	46	29,85	29,86	W.	Ditto—ditto
22	59	46	29,85	29,87	W.—N. W.	Fair—high wind
23	58	46	29,88	29,87	W.—N. W.	Ditto—cloudy
24	57	43	29,84	29,81	W.—N. W.	Ditto—clear
25	53	32	29,77	29,94	W.—N.	Cloudy—frost night
26	52	33	30,04	29,95	N.—N.W.	Fair—clear
27	51	36	29,78	29,62	W.	Cloudy—shower

Hitchen, Herts. WATSON PERKS.

CELESTIAL PHENOMENA, FOR APRIL 1827.

D.	H.	M.	S.	
2	7	0	0	☽ in conj. with ζ in Taurus.
2	15	5	38	♃'s 1st Satt. will emerge.
3	7	0	0	☽ in conj. with γ in Gemini.
4	2	25	0	☽ in □ first quarter.
4	9	34	5	♃'s 1st Sat. will emerge.
5	0	0	0	Clock before the ⊙ 2′ 56″.
6	6	0	0	☽ in conj. with 1 α in Cancer
6	8	0	0	☽ in conj. with 2 α in Cancer
7	14	0	0	☽ in conj. with π in Leo.
9	4	0	0	♃ in conj. with γ in Virgo.
9	12	0	0	☽ in conj. with υ in Leo.
10	0	0	0	Clock before the ⊙ 1′ 30″
11	11	23	0	Ecliptic Opposition or ● Full Moon.
11	11	28	4	♃'s 1st Satt. will emerge.
11	12	0	0	☾ in conj. with α in Virgo.
12	5	0	0	♂ in conj. with δ in Aries.
12	16	0	0	♀ in conj. with λ in Aquarius.
12	23	0	0	☾ in conj. with 2 α in Libra
13	19	0	0	☾ in conj. with κ in Libra
13	23	0	0	☾ in conj. with λ in Libra
14	4	0	0	☾ in conj. with 1 β in Scorpio
14	4	0	0	☾ in conj. with 2 β in Scorpio
14	7	0	0	☾ in conj. with γ in Scorpio
14	9	0	0	♄ in conj. with η in Gemini
15	0	0	0	Clock before the ⊙ 9″
15	9	0	0	☾ in conj. with ρ in Oph.
16	6	0	0	☾ in conj. with 2 μ in Sagitt
17	13	0	0	♀ in conj. with φ in Aquarius.
18	3	19	0	☾ in □ last quarter.
18	10	0	0	☾ in conj. with β in Capri.
18	13	22	9	♃'s 1st Satt. will emerge.
19	0	0	0	☿ Stationary.
20	0	0	0	⊙ before the Clock 6″
20	7	50	42	♃'s 1st Sat. will emerge
20	9	30	0	⊙ enters Taurus.
25	0	0	0	⊙ before the Clock 2″
25	0	0	0	⊙ Eclipsed, invisible at London.
25	15	2	0	Ecliptic conj. or ● New Moon.
25	15	16	19	♃'s 1st Sat. will emerge.
27	9	44	53	♃'s 1st Sat. will emerge.
28	5	0	0	☽ in conj. with ε in Taurus.
29	14	0	0	☽ in conj. with ζ in Taurus.
30	15	0	0	☽ in conj. with γ in Gemini
30	20	0	0	♂ in conj. with A in Taurus.

The waxing ☽ moon—the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL FOR FEBRUARY AND MARCH 1827.

1827.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.	
FEB.					
26	51	30	29,77	29,64	
27	56	45	29,58	29,43	
28	53	34	29,67	29,39	,2
MAR.					
1	54	31	29,33	29,20	,475
2	41	37	29,38	29,14	,25
3	49	36	29,38	29,05	,3
4	51	36	29,00	28,70	,05
5	44	28	29,60	29,34	,05
6	49	24	29,04	28,89	,1
7	50	26,5	29,40	29,07	,175
8	48	34	29,04	28,78	,025
9	42	26	29,42	29,27	,05
10	45	26	29,73	29,60	
11	57	39	29,47	29,40	,15
MAR.					
12	57	43	29,77	29,56	,1
13	57	43	29,80	29,70	
14	51	43	[illegible]	29,56	,175
15	44	37	29,65	29,50	,05
16	49	31	30,00	29,80	
17	48	36	29,55	29,26	,15
18	45	32	30,10	29,82	,05
19	48	25	30,18	30,16	
20	56	40	30,10	30,06	
21	61	43	29,95	stat.	,025
22	58	44	29,96	29,92	
23	59	40	29,96	stat.	
24	58	39	29,96	29,92	
25	50	42	29,96	29,86	

LOWER EDMONTON. CHARLES H. ADAMS.

Lat. 51° 37′ 32″ N. Long. 0° 3′ 51″ W. of Greenwich.

LITERARY AND SCIENTIFIC NOTICES.

Mr. Nicholas Harris Nicholas, F.A.S. has nearly ready for publication, The Siege of Carlaverock, a French Poem, containing an account of the Seige and Capture of Carlaveroch Castle, in Scotland, by King Edward the First, in June, 1301, &c. with a Translation, and an Historical and Topographical Account of the Castle, and Memoirs of all the Individuals who are mentioned. The work will be comprised in one quarto volume, and illustrated by upwards of 100 wood cuts of Arms.

Mr. Nicholson, author of several works on Mechanics, has just published another highly useful work, in octavo, on Carpentry, entitled the "Carpenter and Joiner's Companion, and complete system of lines," illustrated by 180 engravings.

J. Graves, Esq. has been engaged for some time past, in preparing for publication the History and Antiquities of Woodstock, including Biographical Anecdotes, &c.

The Twenty-fourth part of Lodge's Portraits of Illustrious Personages has lately been published, which concludes the Sixth Volume of this valuable work. In this number will be found the portraits of Queen Mary of England, W. Howard, Lord Stafford, Thomas Stanley the first Earl of Derby, Sir John More, and Murray the Regent of Scotland; severally from Holbein, engraved by T. A. Dean; from Vandyke by T. Wright; from Holbein by W. Holl; from the same by E. Scriven; and from a painting in Holyrood House by H. Robinson; all of which bear ample testimony to the talents of the Artists employed. The accompanying biographical sketches are impartial and well written, and though concise, contain much valuable information.

Whether beheld in an Historical or Classical point of view, it must be considered this is one of the most sterling works that has issued from the press, for a considerable period of time.

Mr. Dewhurst is preparing for the press, a System of Osteology, illustrated with Engravings, in Lithography, of the Bones, of the size of Nature, from Drawings taken from recent skeletons, and also from Cheseldan's folio work on the bones.

In the press, in two vols, 8vo. by the Rev. Stephen Hyde Cassan, A.M. Author of the Lives of the Bishops of Salisbury, is about to publish the Lives of the Bishops of Winchester, from the first down to the present time; the book will contain a reprint of an exceedingly scarce volume, known as, "Gale's History of Winchester," though chiefly written by Edward Hyde, Earl of Clarendon.

The Rev. J. D. Fostroke has announced an Encyclopedic account, arranged alphabetically, of the Ancient Remains in Asia, Africa, Europe, (England excepted), and America.

Mr. Jennings has put forth the first part of a singularly beautiful work in imperial quarto; England and Wales, from Drawings by W. Turner, Esq. R. A. with descriptions and Historic Illustrations by H. E. Lloyd, Esq.

The portion of the work published, contains the monastic remains of Rievaulx Abbey, Yorkshire, engraved by Goodall; Lancaster, by Wallis; Dartmouth Cove, by Smith; and Bolton Abbey Yorkshire, also by Wallis. The object of the work is to illustrate the beautiful scenery of our Native Land, the drawings are fine specimens of Mr. Turner's great abilities as a Landscape Painter, the subjects have been well selected for pictorial display, and are most beautiful specimens of what English engravers can perform. The Historical notices, though brief, are sufficient to give increased interest to the subjects so finely depicted.

LONDON:
JOSEPH SHACKELL, PRINTER, KIRBY STREET, HATTON GARDEN.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LXXIX.

Recent Patents.

To Samuel Pratt, *of New Bond Street, in the Parish of St. George Hanover Square, in the City of Westminster, Camp Equipage Manufacturer, in consequence of a communication from a Foreigner resident abroad, and discoveries made by himself, for an Invention of certain Improvements on Beds, Bedsteads, Couches, Seats, and other articles of Furniture.*

[Sealed 18th October, 1826.]

The principle object of this invention is to construct an elastic and swinging seat, couch, or bed, to be used on ship board, for the purpose of preventing the unpleasant effects experienced by some persons from the motions of the vessel, called sea sickness.

The improved apparatus may be fitted up in various ways, the leading features being a suspension of the frame of the seat or couch upon jimbles or joints turning at right angles to each other, and an elasticity produced both in the seat or cushion, and in the swinging frame by the employment of spiral metal springs.

Having formed the frame of wood-work, on which the seat or cushion is to be placed, and of any required dimensions and shape, according to the purpose, (whether of a seat, couch, or bed,) to which it is to be applied, the lower part of the frame of the cushion is to be covered with strained canvas, and braced with webbing: or the foundation may be otherwise laid, as the seats of chairs or couches are usually done. Upon this any convenient number of spiral springs are to be placed, such springs being made by twisting steel or iron wire into the form of an hour glass, that is, like two cones united at their apexes. The lower parts of these springs are to be sewn to the canvas or webbing, and their upper parts secured in their proper situations and erect positions by pack-thread or small cords, tied or braced from one to the other crossing like a net. On the tops of these springs, the usual covering of canvas is laid, and then a thin layer of horse-hair or wool, upon which the outer covering is fitted and finished agreeable to the taste of the manufacturer.

It is obvious, that according to the kind of seat or couch to be made, whether chair, sofa, or bed, so must the arrangement of the parts be varied, which are to constitute the frame or swinging apparatus; it has therefore, been only thought necessary to shew the construction of a swinging frame for a small couch, as every other kind of seat or couch will be but a variation in dimensions of some of the parts, without deviating from the general principle of construction.

Plate V, fig 1, is a front view of a couch or settee, with its wood-work and swinging frame upon which the cushion *a*, *a*, is mounted, this cushion is formed in the manner above described, and is rendered elastic by the spiral springs attached to the webbing within the coverings as explained above, and shewn by dots in this figure.

The form of the wooden frame of the couch, that is the frame upon which the cushion is constructed, may be varied in any tasteful way, according as fashion shall dictate, but that of the swinging frame below, will not admit of much variation except in dimensions, and in the introduction of a greater or less number of springs, or a balance weight at bottom; according to the kind of article whether a chair, or couch, or a bed is intended to be made. Fig. 2, is a plan or horizontal view of the swinging frame, shewing more clearly than the former figure, the manner in which the lateral springs are applied below to meet and afford resistance to the swinging frame as it vibrates. The upper rim of the swinging frame, seen at *b*, *b*, fig. 1, is made of wrought iron, upon which the couch or seat is secured; *c*, *c*, are rods or arms connecting the upper rim with the bottom bar *d*, *d*, or in place of this bar, a box containing weights may be substituted; *e*, *e*, are spiral springs applied to the sides and ends of the bottom bar, which springs are held by brackets extending from the bottom frame *f*, *f*, or instead of the brackets, a rim or plate of metal may be placed round the bottom of the apparatus for the springs to bear against.

The upper rim *b*, *b*, of the swinging frame is attached by joints *g*, *g*, to the second rim *h*, *h*, and this by similar joints *i*, to the standards *k*.

Thus the seat or couch is made to swing upon jimbles, having a free vibratory action upon its joints, which with the elastic cushion will enable the couch to give way to pressure, and when one or more persons are seated or

recumbent upon it, the effects of the pitching and rolling of a ship at sea, will become in a great measure nullified.

The same principle of construction will apply to differently formed seats, couches, beds, or cushions, their variations being only in the number and disposition of the springs, and the cushions so formed may be used on land as ordinary seats, couches, or beds, as well as at sea.

[*Inrolled April*, 1827.]

The Editor feels much pleasure in being enabled to speak of this invention from his own experience, having been favoured with the use of the apparatus a short time back on a journey to Paris, on which occasion he submittted it to what he considers to be a very conclusive trial, both on ship-board as a preventive against sea sickness, and on land as a travelling seat.

To such persons as are unaccustomed to the sea, a short voyage in rough weather is generally productive of very unpleasant feelings of nausea. None are more susceptible of this sensation than the writer, and therefore he presumes that the experiment about to be mentioned, may be allowed to have been a fair one.

As soon as he entered the packet to cross the Channel, he took his seat upon the new apparatus, and remained so seated for more than two hours, without experiencing the slightest sensation of nausea, though many persons near him suffered considerably. Thinking that the particular condition of his stomach at that time might render it less susceptible of derangement than usual, he was induced to quit his seat, and walk the deck, but scarcely had he proceeded twenty paces before the agitation of the vessel produced nausea, he with difficulty regained his seat, and immediately the stomach became tranquil, in which state it remained, for he no more quitted his elastic couch until the vessel arrived in port.

In order to try the utility of this adaptation of springs, as a travelling seat, the cushion of the apparatus was placed within the Diligence. To those who are acquainted with French Diligences, and with French roads at the worst time of the year, it will be something in accommodation to say, that the elasticity of this cushion made with wire springs in the manner above described, was such as perfectly to counteract the jolting action of those uncouth carriages, and that having rode in the Diligence for more than thirty hours from Boulougne to Paris, seated upon this cushion, the journey produced little or no sensation of fatigue.

Several persons have we understand in company with the patentee, lately made a voyage of experiment in a sailing packet, for four days in the channel, and the effects which they all experienced where precisely similar to those above stated. There can therefore remain no doubt but that the employment of this elastic seat on ship-board, will in all cases in a great degree alleviate if not effectually prevent that distressing sensation of nausea, to which most people are more or less susceptible in the commencement of a voyage, or on a short trip to sea.

We would strenously recommend to the patentee to place a few of his elastic swinging seats at the principal ports of embarkation, particularly at Dover, Brighton, Holyhead, and Liverpool, and to let them out at small charges, to passengers who are crossing the sea. Such an arrangement would be a great accommodation particularly to invalids, and would we have no doubt produce an ample remuneration to the proprietor.

We perceive that beds, sofas, chairs, and a variety of other articles for home use, as well as cushions for carriages, and even saddles for riding, are made by the patentee upon the principle of the spring wire cushion, which is much cheaper in construction, than any other kind of elastic seat or cushion, stuffed with wool or horse hair, and is certainly vastly superior in softness and elasticity, to any other sort of cushion that has been before produced.

To John Gotlieb Ulrich, *late of Bucklersbury, Cheapside, in the City of London, but now of Upper Rosamond Street, in the Parish of St James's, Clerkenwell, in the County of Middlesex, Chronometer Maker, for his Invention of certain Improvements on Chronometers.*

[Sealed 25th March, 1825.]

The patentee says, that his improvements on chronometers will be best understood by referring to the ordinary construction of chronometers, and by pointing out such parts as he considers to be defective in principle.

With this consideration and preface, he proceeds to say—" Upon the present principles of construction, the impelling power, viz. the main spring, communicates its impulse to the balance, through a long train of wheels and pinions, whereby innumerable inaccuracies are liable to arise from the imperfect shape of the teeth, from the varying fluidity of the oil applied to the pivots, and from the unequal force of the main spring itself, in the different parts of its tension. These irregularities are increased by the multiplied velocity at the end of the train, so that the impulse given to the balance will not be uniform, and its motion is impeded by the force it is made to exert in unlocking the train detent." To remedy these objections, it is proposed so to construct the escapement of the improved chronometer, that the power of the main spring shall not immediately give impulse to the balance through the train, but shall raise an independent *remontoir* spring lever, for the purpose of striking a detached balance, and causing it to vibrate, independently of the train. While the irregularities, whatever they may be, of the train are thus got rid of, which would interfere with the regular going of the chronometer, the return of the balance releases an independent spring lever, which after giving a new impulse to the balance, proceeds by a blow to unlock the train at *regular intervals*, and effect the successive escapements.

In Plate VI, fig. 1, represents the several parts of the improvement (the escapement being in a state of rest). The chronometer is constructed with a train of wheels as usual, up to the escape-wheel *a*, which is moved by a pinion upon its axle; *b*, is the train detent (shewn detached in fig. 2,) having a ruby pallet *c*, at its extremity, which stops the rotation of the wheel *a*, by locking against its teeth; *d*, is the independent spring lever, or *remontoir*, for giving impulse to the balance. This is locked in a state of tension by a ruby catch pallet *e*, at the end of the impulse detent *f*.

When the balance *g*, (which is shewn in a vertical position in fig. 3,) has been put in a state of vibration, and is moving in a retrogade direction, the pallet *h*, upon its axle, is enabled to pass the end of the impulse lever *d*, freely, and the small pallet *i*, also upon the axle of the balance lower down, escapes past the spring *k*, at the back of the impulse detent; but when the balance returns, the small pallet *i*, coming in contact with the end of the spring *k*, causes the impulse detent *f*, to be moved sufficiently for to enable the catch pallet *e*, to slip from its hold through a notch *z*, at the end of the lever *d*, shewn in the vertical view, fig. 4. The spring of this *remontoir* lever *d*, now exerting its force, throws the lever forward, and causes its end to strike against the pallet *h*, upon the axle of the balance, giving it a new impulse. But it has a further important office to perform, viz. unlocking the train, for when the lever *d*, has reached the situation shewn by dots, it quits the pallet, and proceeds forward, by which means an inclined plane *y*, near the end of the impulse spring lever, (see fig. 4,) strikes against the pallet *c*, at the end of the train detent (shewn separately at fig. 2,) and pushes the pallet from the tooth permiting, the escape wheel to run. The tooth 7, of the escape wheel now pressing against the pallet *l*, of the semi-circular plate, causes the plate to turn upon its pivots and bring the lifting arm *n*, (see the detached figure 6,) into the position shewn by dots in fig. 1, and with it the spring lever, which by that means is again locked by the pallet *e*. Immediately after this, the tooth 9, comes against the pallet *o*, and returns the semi-circular plate and the lifting arm *n*, into the position shewn in the first figure which brings the spring of the *remontoir* lever into a state of tension, ready to give the next impulse. The tooth 15, by this time having arrived at the pallet *c*, the escape wheel is stopped. The pallet *i*, now striking again upon the end of the spring *k*, as before causes another tooth of the wheel *a*, to escape, and so on. Thus the regulation of the train is effected.

In order to prevent the escape wheel and the spring lever from tripping, two precautionary contrivances are introduced, the first of which is, a guard spring *p*, attached by a screw to the plate at *q*, from which spring, a bent arm *z*, extends, and when the end of the spring escapes from the tooth of the wheel *a*, the bent arm *r*, comes against the side of the impulse detent *f*, and prevents it from vibrating; the second contrivance is adapted to confine the train detent, and compel its pallet to lock against the tooth of the wheel *a*, for which purpose a swelling piece *s*, is attached to the side of the train detent *b*, which so nearly fills the notch *y*, fig. 4, in the spring lever *d*, that the detent is prevented from moving.

These precautionary contrivances, are said to form most essential parts of the invention, and which are therefore particularly claimed by the patentee. As however, there are several parts exhibited in the drawings which are not new, and others that are new, which will admit of being modified and adapted in several ways besides those shewn, it is to be understood that the claim of invention and patent right consists in the following particulars:—first, in a mode of performing the two operations of returning the spring lever to its detent, and of giving tension to its spring, by the two opposite motions of the alternating pallets; Secondly, in unlocking the train by a force independent of the balance; thirdly, in the mode of preventing the train detent from jumping out of the teeth of the escape wheel, at the time the tooth comes in contact with it, and also of preventing the escape of the impulse spring from its detent at the period of locking, which two last mentioned objects are of particular importance to all *remontoir* escapement as the accidental escape of several teeth, commonly called tripping, is by these means effectually prevented, without interfering with the action of any of the mensurating parts of the mechanism.

The actuating parts of the chronometer are not shewn in the drawing, as they are to be upon the same principle as is usually applied to chronometers, the improvements consisting simply in the new mode of regulating the movements of the works, by unlocking the train at regular intervals.

[*Inrolled May*, 1825.]

To ALEXANDER GALLOWAY, *of West Street, in the City of London, Engineer, for his Invention of a Machine or Machines for the Forming and Moulding of Bricks, and other Bodies usually made from Clay, Plaster, or any of the usual Materials from which Building or Fire Bricks are commonly made.*

[Sealed 14th May, 1825.]

THIS machine for moulding bricks, is shewn in Plate VI, at fig. 7. It consists of a fixed horizontal table *a*, supported on standards *b*, *b*, upon which table a wheel *c*, is made to revolve, this wheel carrying the moulds that the bricks are to be formed in.

Previously to describing the evolutions of the machine, it is necessary to say, that there are one or more recesses or apertures through the face of the wheel *c*, containing the brick moulds, and that the clay having been introduced into a box *d*, is from thence forced upwards by means of a piston *e*, into the moulds, the bricks being formed as the wheel goes round, in the manner about to be described.

A rigger with a band, leading from a steam engine, is affixed to one end of the horizontal shaft *f*, which may be called the main shaft, as it drives all the operative parts of the engine. At the reverse end of this shaft, there is a bevelled pinion, taking into a bevelled toothed wheel *g*, affixed to the perpendicular shaft *h*, and the pinion just mentioned being capable of sliding to and fro, may by means of a clutch box, be thrown out of gear, and hence the machine stopped.

On the upper part of the shaft *h*, a wheel *i*, is fixed, having teeth round a part of its periphery, which are intended to take into the teeth of the wheel *c*, and to turn it upon its axis, as the wheel *i*, revolves; but when the blank part comes round, the wheel *c*, necessarily remains at rest, which is the time that the clay is being pressed into the moulds.

The clay or other material, having been properly prepared for making the bricks, is deposited in certain recesses on the upper side of the wheel *c*, (by means of a hopper, the patentee says, but we do not see exactly in what situation the hopper is to be placed.) By the rotation of the wheel *c*, the clay is brought over, and allowed to drop through a perforated part of the table, into the box *d*, the piston being at that time down; but as the shaft *f*, comes round, an excentric or cam *k*, raises the piston rod *e*, and causes the piston to force the clay upwards into the mould, which is at that time immediately over the box *d*. The wheel *c*, now resumes its movement, and the superfluous clay is scraped off the mould by the edge of the perforated part of the table. The rotation of the wheel having brought the mould to the opposite side, the bricks are forced out of the mould by several plungers *l*, which are held up by spiral springs until the piece *m*, on the top of the plungers having been brought under the enclined plane *n*, the plungers are depressed, and the bricks expelled from the moulds through an aperture in the table, and are received on to an endless band below, or in any other manner conducted away.

The patentee proposes to construct a double machine upon this principle by adding to the right hand of the shaft *h*, another arrangement of parts exactly similar to those already described, in which case, the wheel *i*, is to actuate a similar mould wheel to *c*. Another horizontal shaft like *f*, to be turned by the bevel wheel *g*, is to work the moulding piston.

There are a variety of provisions for adjustment, and the whole arrangement of the mechanism appears to be judiciously contrived, but there is so much difficulty in removing moist clay from any kind of moulds, in consequence of its adhesiveness, that we should be no less surprised than gratified to find a machine that would really make bricks with certainty and effect.

The patentee states, that many of the parts of this machine are common and well known mechanical contrivances, to which, of course, he lays no claim; and that those which are new, may be differently modified and arranged; he therefore claims—first, the fixed table with apertures for the actions of the piston, and the discharging apparatus; second, the moulding wheel being moved at intervals, by interrupted gear; and third, the manner of actuating the moulding and discharging pistons, by the rotatory cams and the enclined plain.

[*Inrolled November*, 1825.]

To Henry Oswald Weathersey, *of Queen Ann Street, in the Parish of St. Marylebone, in the County of Middlesex, for his Invention of certain Apparatus or Machinery for the purpose of Splitting, Rending asunder, Cutting, or Cleaving of Wood, and forming and securing the same in Bundles.*

[Sealed 14th May, 1825.]

This is a very elaborate apparatus, designed to perform a very unimportant business, its objects being merely to cut up refuse wood into small pieces, and afterwards to bind those pieces into small bundles, such as are commonly sold in the chandlers and coal shops of London, for lighting chamber fires. There is, however, considerable ingenuity displayed in the contrivance of this machinery, for it is indeed machinery, and of no small magnitude, we therefore feel ourselves bound to give some sort of representation of the contrivances, though without intending to enter into all the elaborate details set forth in the specification, and we cannot but regret that so much ability and expence, for we have no doubt the machinery has really been made, should have been bestowed upon an object, according to our view of the matter, by no means deserving of it.

Plate V, fig. 3, is a side view of the machine, for cutting and cleaving the wood; *a,* is a circular saw turned by a rigger, and band, communicating with the rotatory part of a steam engine. There are adjustable guides upon the bed *b,* by which the pieces of wood are all confined to certain situations, for the purpose of being cut by the saw into equal lengths; and when that is done, the blocks are placed upon the endless band *c,* and carried forward in erect positions into the box or compartment *d,* where the chopping knives *e, e,* are made to fall upon the blocks, and to split or rend the wood asunder; that is, chop the blocks into sticks of small substance.

There is a rotatory shaft at the upper part of the machine, turned by any convenient power, having arms *f, f, f, f,* with anti-friction rollers at their extremities, which act as tappets, raising the stem *g,* of the chopping-knife; and upon the axle of this rotatory shaft there is also a cam-wheel *h,* that works a lever *g,* for the purpose of moving the endless web, and carrying forward the blocks of wood.

Let it now be supposed that one or more of the blocks of wood are brought into the compartment *d*, under the knives *e, e*, the tappets *f*, as they revolve acting against a projecting piece *i*, affixed to the stem *g*, raises the knives successively, and which knives being allowed to fall with considerable force upon the block below, at every stroke chops off a slice of the wood, in a perpendicular direction. The rotation of the cam-wheel *h*, as above-mentioned, moves the lever *k*, to which lever a rod *l*, is attached, having a click at its end, acting in the ratchet-wheel *m*, on the axle of one of the rollers of the endless band. By this connection the rising and falling of the lever *k*, causes the click and ratchet-wheel to draw the endless web with the blocks of wood progressively forward, into the compartment under the chopping knives.

The knives *e, e*, are set obliquely at opposite angles, crossing the compartment *d*, in diagonal directions at right angles to each other, by which contrivance the first knife chops off diagonal slices from the blocks of wood as they advance, and the second knife crossing the slice, chops it again into small square sticks, which are discharged at the end of the compartment. The box *d*, is enclosed at top and bottom, in order to confine the pieces of wood, there being slits in its top to allow the knives to rise and fall.

The wood having been thus cut into blocks of suitable lengths, and afterwards chopped into sticks, is now ready to be tied up in bundles, which is done by the machine represented at fig. 4; *a, a*, is a circular table, turning loosely upon a vertical shaft *b*. Attached to this table there are elastic hoops *c, c*, intended to receive the sticks of wood about to be made up into bundles. There is a flat semi-circular plate supported by the standards *d, d*, which extends half round the table, for the purpose of forming bottoms to the elastic hoops *c*, while they are filling with sticks; *e*, is a wheel having four ratchet-teeth in it, and *f*, is a spring-click taking into those ratchet-teeth, which click is moved by a crank-rod *g*.

The crank-shaft *h*, being put in motion, at every revolution it draws the click, and moves the table round one quarter of a circle, bringing the hoops *c*, with the sticks, successively into the situation shewn at A, where the bundle is about to be tied up. The means by which this tying up of the bundle is to be effected, is involved in a very complicated and elaborate series of wheel-work, which we have thought it unnecessary upon the present occasion, considering the limited use of the machine, to set forth in detail. A portion of the machinery, however, for tying up the bundle, is seen at the left hand of the figure, which is actuated by bevel gear, *k*, *l*, from the main shaft. Its principle effects are these.

The spring-hoop, with the sticks being at A, a cam *m*, forces the rod *n*, which is connected to the hoop *c*, and by that means draws the spring or clip into a smaller diameter, and confines the sticks firmly in the hoop while they are bound. At top of the machine there is a reel *o*, carrying a quantity of thin wire, a length of which is brought down through the stem and flyer *p*, and the end of the wire taken hold of by a pair of plyers *q*, while a movement of the toothed-wheel *r*, carries the flyer *p*, round the bundle of sticks, and causes the length of wire, given out from the reel *o*, to embrace the bundle. The plyers *q*, are now made to revolve upon their axis, for the purpose of cutting off the length of wire, and twisting the two ends together, which being done, the sticks are securely bound, and the operation complete.

Another movement of the table brings the next spring hoop, with its sticks into the situation of A, to be tied up in its turn, and so on; that which has been tied falling through its hoop to the ground as the table revolves.

[*Inrolled November*, 1825.]

To Robert Hicks, *of Conduit Street, in the County of Middlesex, Surgeon, for his Invention of an Improved Bath.*

[Sealed 22nd March, 1825.]

The improvement proposed by the patentee, is the introduction of a flue in the bottom of a portable bath or slipper, the water in which is to be heated by the flame of turpentine or other combustible fluid, or by illuminating gas.

The general form of the bath is not intended to differ from the ordinary kind of portable vessels commonly used for chamber bathing, which run upon castors, and are calculated to hold an adult person in a recumbent posture. The vessel may be made of copper or sheet iron, and have a broad thin flue made of metal tube, extending over its bottom, and a recess in front, into which the combustible fluid is to be poured, with a board covering the flue, as a flooring to the bath, to prevent the surface of the heated metal from burning the bather.

A vessel on the side of the bath, is to hold a sufficient quantity of turpentine or other combustible liquor to feed what may be called the furnace beneath, for heating the cold water contained in the bath. The combustible liquor is delivered through a small pipe and cock, into the receptacle or furnace in front of the bath, and being there set fire to, the flame passes through the flue under the bath, and heats the water in a few minutes, the smoke and heated vapour passing off through a temporary chimney at the end of the flue into the fire place of the room.

Instead of turpentine or other inflammable liquor, the patentee proposes under some circumstances to employ a portable vessel filled with condensed illuminating gas, and to carry the burner under the bath, passing its flame through the tube as described above.

In this manner water may be heated for ordinary warm bathing, or any other medicated fluid may be employed, and after use, be drawn off by a cock in the lower part of the vessel.

[*Inrolled September*, 1825.]

TO RALPH STEPHEN PEMBERTON, *and* JOHN MORGAN, *of the Parish of Lanelly, in the County of Carmarthen, for their Invention of a Consolidated or Combined Drawing and Forcing Pump.*

[Sealed 21st October, 1825.]

THE patentees do not propose any novel feature in the principles upon which their pump is constructed, but simply combine the mechanism of lifting and forcing pumps, and connect them to one lever. The manner of doing this is exhibited in Plate VI, at fig. 8, which is a section of the pump barrels and chamber, shewing the situations of the valves and plunger. *a*, is supposed to be the reservoir, from whence the water flows through a grating or small perforations into the rising main *b*. The foot valves as they are commonly called, are placed at *c*, intercepting the water way; *d*, is the barrel of the force pump; *e*, the barrel of the lift pump, *f*, is a plunger fitted by means of packing to the cylinder *d*, and passed through a stuffing box *g*, which to render the joint more perfectly air tight, is formed as a cup and filled with water; *h*, is the sliding valve box, acting in the same way as the bucket of an ordinary lift pump. Both the plunger *f*, and the valve box *h*, are connected by rods to the vibrating lever *i*, and this being moved by any of the ordinary means, works the pumps.

On the descent of the plunger *f*, the water which occupied the barrel *d*, is forced into the barrel *e*, and through the open valve box *h*, the foot valves *c*, closing at that time, and preventing the water from descending into the cistern below. On the rising of the plunger, a vacuum would be produced in the barrel *d*, but that the foot valves opening, allow the water to flow up and occupy the place of the plunger in the barrel *d*, at the same time the box *h*, rising, and its valves closing, cause that volume of water which had been forced up the barrel *e*, through the valve box *h*, by the previous descent of the piston, to be lifted up by the barrel *e*, and discharged into the trough *k*.

This is the proposed action of the combined pump, and in a similar way, several pumps may be united together, and put in motion by one or more vibrating levers, which combination of a lifting or drawing pump, with a forcing pump, constitutes the novelty claimed under this patent.

[*Inrolled December, 1825.*]

To CHARLES DOWNING, *of Biddeford, in the County of Devon, Gentleman, for his Invention of certain Improvements in Fowling Pieces, or other Fire Arms.*

[Sealed 15th August, 1825.]

THESE improvements are intended to apply principally to such guns as are discharged upon the principle of percussion, that is by the employment of a detonating composition, which shall by its explosion inflame the charge of powder. The patentee proposes to use this detonating material in the state of small granulated particles, about the size of coriander seed, and to introduce a few of these particles into the touch-hole of the piece as a priming.

The improvement proposed is principally in the mechanism of the gun lock, and has for its primary object a novel construction of main spring. Plate VI, fig. 9, shews a section of part of a fowling piece with the new mechanism constituting the lock placed in a recess within the stock; *a*, is the cock, having a pin or plug at *b*, which is intended to strike into the touch-hole *c*, where the detonating composition is deposited, and by the force of the blow, to produce an explosion; which passing through a small channel into the breach, there ignites the charge of gunpowder; *d*, is the sear, acted upon by a spring behind, which presses its point into one of the notches at the back part of the cock; *e*, is the trigger which being drawn back, raises the tail of the sear, and withdraws its point from the notch of the cock.

The main spring constitutes the guard *f*, which being made in the form of a bow of tempered steel, and drawn up to tension, is attached to the front part of the cock, by a joint *g*. The cock therefore being drawn back, that is, the piece being cocked ready for discharging, the pressure of the finger upon the trigger withdraws the point of the sear, and allows the cock to be brought down with great force by the spring *f*.

In order to confine the priming, there is a sliding piece *g*, forming a construction of the guard; which sliding piece covers the touch-hole, when the lock stands at half cock, and at full cock; but when the trigger is pulled, the falling of the cock draws down the sliding piece *g*, and opens the touch-hole for the purpose of allowing the plug to strike into it. There is a piece of wood *h*, affixed to the under part of the gun stock, which is intended to protect the spring guard from accident. Through a slit in this piece the guard passes, and it is further designed as a rest to the left hand in the act of priming.

This construction of mechanism may be adapted to a flint lock, if that should be required, by forming the lower part or tumbler of the cock and its appendages like that described, but in that case, the upper part of the cock must be furnished with chaps for holding a flint as usual, and a pan and cover of the ordinary kind may be attached by uniting it to a plug, with a touch hole perforated through it, and screwing that plug into the barrel at the part marked with a circle, and lettered *i*. Or, by a slight variation in the construction, the cock may be connected to the tumbler *a*, by a stem or axle brought out from the tumbler to the side of the piece; to the end of which stem, the cock is to be attached, and consequently, will move with the tumbler in the way above described, and upon the same principle, the sear and trigger being the same, and the main spring forming the guard.

Another modification of the same plan is shewn at fig. 10, in which *a*, is the cock, *b*, the plug or punch for giving the blow to the detonating material; *c*, the touch-hole, from whence a small channel passes to the interior of the barrel, for the purpose of conducting the flame of the explosion to the gunpowder within; *d*, is the sear, with a spring behind it pressing the point into the notch at the back of the cock. The tail of the sear in this instance is brought down in a perpendicular direction, and constitutes the trigger by which the piece is to be let off.

The front of the cock has a projecting part to which the spring guard is attached by a joint, as in the former plan, and which thereby constitutes the main spring that impels the cock, *e*, is a bent piece, attached by a joint to the lock, the end of which piece is intended when the cock is drawn back, to fall into the recess or touch-hole *c*, and there is another piece *f*, also turning upon the same joint, which is designed to close in the recess, and confine the lower piece, so as to cover up the touch hole, and the internal parts of the lock, and secure them from rain or the moisture of the atmosphere. When the trigger is pulled the sear liberates the cock, as above described, the top part of which in striking, throws up the two pieces *e*, and *f*, and exposes the touch hole to the blow of the plug *b*.

There are some other slight variations proposed in the modifications of the several parts of the lock, but upon the same principle of action, the leading feature of novelty being the adaptation of the spring guard to the purpose of a main spring.

[*Inrolled October*, 1825.]

To Charles Macintosh, *of Crossbasket, in the County of Lanark, in Scotland, Esq. for his Invention of a new process for making Steel.*

[Sealed 14th May, 1825.]

The object of the patentee, is to communicate carbon to iron, when raised to a very high degree of temperature, by bringing into contact with the iron gases which are impregnated with carbon. The gas which is proposed to be employed in this process, as most convenient and economical for the purpose, is that evolved from coal when under distillation.

To perform the operation, the patentee proposes no particular construction of apparatus, but merely that the iron which is to be converted into steel, shall be enclosed in a crucible or melting pot, made of the usual materials, and inserted in the furnace, and that when the temperature of the iron is sufficiently raised, a jet or current of the gas shall be thrown into the crucible through a suitable aperture and tube provided for that purpose, and that another aperture shall be made in the cover of the crucible, to allow that portion of the gas to escape which has not been taken up by the iron.

These are all the instructions given for the performance of the process, as the patentee claims the impregnation of iron at a high temperature, with carbon in a gaseous form.

[*Inrolled November,* 1825.]

To William Pope, *of Ball Alley, Lombard Street, in the City of London, Mathematician, for his having Invented certain Improvements on Wheeled Carriages.*

[Sealed 3rd December, 1825.]

The improvement herein proposed is designed to prevent the overturning of carriages, in the event of one of the wheels running upon a bank, or over a large stone, or any other elevation by which the side of the carriage might be raised so as to endanger its falling over.

The plan proposed by the patentee (which is very imperfectly set out in the specification) appears to be a mode of connecting the axle-tree of the hinder wheels of the carriage, to the axle-tree of the fore-wheel, by means of a horizontal spindle or axle; by which mode of connecting the two axle-trees together, whenever one of the wheels is raised by running over an elevation, its axle-tree in rising, turns in a vertical direction upon this connecting spindle, without lifting the other axle-tree, hence the body of the carriage is enabled to preserve its level position.

The same contrivance is said to be applicable to two wheeled carriages, but in what way it is to be adapted we do not perceive.

It is intended if we are not mistaken to fasten the shafts, or if a curricle, the pole to the body of the carriage, allowing the axle-tree to turn upon a horizontal pin or spindle, connecting the body of the carriage and the axle-tree together; and in that case the ends of the shafts are to be braced tightly to the shoulders of the horse, which is to be provided with suitable straps and harness for the purpose.

[*Inrolled June,* 1826.]

To William Pope, *of Ball Alley, Lombard Street, in the City of London, Mathematician, for his having Invented certain Improvements in Making, Mixing, Compounding, or Altering the Article of Soap.*

[Sealed 3rd December, 1825.]

This invention does not apply to making soap in the first instance, but to improving it after it is made; for which purpose the patentee proposes to take soap of good quality, and shave or slice it into thin pieces, then mix it up with a quantity of marl of the purest kind, and also some potash or alkaline salt. When these materials have been properly combined by stirring up in a suitable vessel, a quantity of water is to be poured upon them, and the whole allowed to stand until the soap is thoroughly dissolved.

The materials are then to be well stirred up, and the composition being of about the consistency of cream, it is to be boiled, and then poured out into suitable moulds for making it into cakes, and when dry, is to be cut into such pieces as may be required for use. When the composition is in a soft state, it may be perfumed, if intended for the toilet, but in that case, the soap should be of the best quality.

The proportional quantities proposed of each material, are, to every hundred weight of soap, seven pounds of marl, two ounces of potash, and a sufficient quantity of water to reduce the whole into a fluid state.

This process will greatly improve the soap, by destroying the effects of the costic alkali upon the skin, and rendering it soft and smooth.

[*Inrolled June*, 1826.]

To Nathaniel Kimball, *of New York, in the United States of North America, but now residing in Falcon Square, in the City of London, Merchant; in consequence of a communication made to him by a certain Foreigner residing abroad, for the Invention of a process for converting Iron into Steel.*

[Sealed 13th October, 1825.]

The converting of iron into steel, is by the introduction of carbon into the metal, which is usually done by surrounding the iron with charcoal, or some other carbonacious matter, in a furnace. The improvement proposed by the patentee is not the mode of conducting the operation, but in the material or composition employed for that purpose.

Instead of charcoal, a mixture of one ounce of sal-ammoniac, one ounce of borax, one ounce of alum, and one quart of fine salt is to be prepared; which, after being enclosed in a retort or other vessel, and submitted to a red heat, is to be allowed to cool, and then to be pounded into a fine powder. Another mixture is also to be made, consisting of four quarts of soot, two quarts of the powder of burnt leather, two gills of burnt horses hoof, one pint of fine salt, one quart of vinegar, and two quarts of wine. These are to be stirred up together to the consistency of mortar, and when dried into a cake, are to be pounded as the former.

The two mixtures of materials are now to be carefully compounded together, and sifted over the surface of the several layers of iron which is about to be converted into steel; the iron being afterwards closed up in a vessel, and covered with sand to prevent the access of air or any kind of gas to the interior of the vessel.

In this way, the patentee proposes to convert any kind of wrought iron articles,-such as sword blades, or knives, into steel, taking care to cover the iron with the prepared compound, and to submit the articles in closed vessels to the action of the heated furnace, the time requisite for effecting the object, must depend upon the substance of the articles under operation, which can only be known by experience; from eight, to twenty eight hours, the patentee says will be required, and the quantity of carbonacious material described above, will be sufficient for converting one hundred weight of iron.

[*Inrolled April,* 1826.]

The patentee, in proposing the employment of several of the materials which constitute the above described mixture, and the particular proportions of each as stated above, certainly does not mean for us to consider the common sense of the case, but to look upon it as a *magical* compound. Our readers will find all the essential parts of the materials above mentioned, described in the several patents for preparing iron and steel in our preceeding volumes.

To JOHN BEEVER, *of Manchester, in the County of Lancaster, Gentleman, for his having Invented an Improved Gun Barrel.*

[Sealed 3rd December, 1825.]

THE patentees invention is making gun barrels of an oval or elliptical figure in the bore, instead of circular as usual, which he considers will discharge shots in a more effective range, than the circular barrels of the ordinary construction.

It is proposed to take the ordinary kinds of gun barrels in their rough state, after they have been welded into the cylindrical form usually adopted, and to heat them red-hot, then pass an elliptical rod into the barrel by hammering or otherwise, so as to enlarge its diameter in one direction, and compress it in the other; that is press the circular tube into an elliptical figure. When the barrel has been thus formed it may be completed by drawing, in the manner that tubes are commonly drawn, and then finished by the insertion of a breech in the ordinary way; after which the gun is to be fitted to a stock, and the other parts appended as usual.

The manner by which the barrel is formed into the elliptical figure, constitutes no part of the invention: that may be done by any convenient means, the substantial part of the invention being the employment of elliptically bored gun barrels, instead of circular bores as usual, and which the patentee considers will give a more effective range to the charge of shot than the old form.

[*Inrolled April*, 1826.]

Original Communications.

To the Editor of the London Journal of Arts.

Birmingham, April 4th, 1827.

SIR,

IT may perhaps be interesting to some of your readers to be made acquainted with the mode by which the three greatest nations of antiquity, the Egyptians, the Athenians, and the Romans, divided their year. If you think so, I shall transmit you in my next, the Athenian year.

I am, SIR,
Your obedient Servant,
BEN. COOK.

The Egyptian Year.

IT appears that the first people that formed themselves into states after the Deluge, gave only to their years, 360 days. The Egyptians soon perceived that this year was shorter than the revolution of the Sun; they therefore prolonged it by five more days, which they added to the end of the twelve months, without making them a part of either of them. Those states of Greece that adopted these five days, called them *E'pagnomenæ*, or added. In Egypt, each of these days received the name of one of their Divinities; *Osiris, Aroueris, Typhon, Isis, Nephthé*, or *Assophras*, sister to Isis. But the Egyptians still saw that their year was yet too short, and that it was necessary to add a day more to every four years, in order to make it correspond with the movement of the Sun; but from religious scruples, they would not calculate among the other days, this sixth added day, in order that the commencement of their year should be indefinite. Thus each day of the year was sanctified successively by Fêtes and rejoicings, which happened in the course of a cycle or period *Caniculaire*, of 1460 days. It is thought nevertheless that the Egyptians had also a civil year, the commencement of which was fixed, and which, in very distant times, was marked by the Heliacal rising of *Sirius*, or the Dog Star, the 20th of July.* It was not until the time of Augustus, that they adopted the Julien year, and they made it to commence in the month of August; twelve gods presided over the twelve months. They divided the year also into 36 parts of ten days each, and placed each of these divisions under the protection of inferior divinities. These genii or spirits were called *Dècans Impecteurs*, or watchers over portions of time of ten days, they had their names, and particular functions allotted to them, and their astrologers attributed to them the most extensive influences over diseases and health. It has been supposed by some, that the Egyptians divided their year into 36 parts, after the divisions of their country, which was divided in 36 *Nomes* or governments. The lucky and unlucky, or happy and unhappy days, formed a part of the religion of the ancient Egyptians, they observed them with great exactness, and it is from them that arose the superstition of the *Egyptian days*, or days unhappy or unlucky, which the councils had a great deal of trouble to abolish; they are still found indicated in the calenders of the 9th century.

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* Owing to the precession of the Equinoxes, Sirius does not now rise *Heliacally*, until September.—EDITOR.

Egyptian Names of the Months.	Roman Months commenced the	EXPLANATION OF THE EGYPTIAN NAMES.
1—Troth	—29 Aug.	—Signal of the opening of the year, the time of the vintages. God protector, Phta.
2—Paophi	—28 Sept.	—The month of the Serpent, emblem of the Equinox, time of fishing. God protector, Typhon.
3—Athyr	—28 Oct.	—Month of Athyr or Venus, Goddess of Fecundity, the overflowing of the Nile has ceased. God protector, Horus.
4—Choiac	—27 Nov.	—Month of flowers and verdure. God protector, Pan.
5—Tybi	—27 Dec.	—Tyb or good, the sun ripens the seed, the annual re-election of the magistrates. God protector, Agathodemon.
6—Mechyr	—26 Jan.	—Month of the Celestial Venus, the Melitta of the Assyrians, the sea becomes navigable. God protector, Nephtis.
7--Phaménoth	—28 Feb.	—The Month of Spring, announcing the harvest. God protector, Ammon.
8—Pharmuthi	—26 March	—Time of harvest, the gathering and treading out of the corn.
9—Pachon	—25 April	—Month of Chon or Hercules, the sun is now in all its force, the midsummer of Egypt. God protector Horus or Harpocrate.
10—Payni	—25 May	—This may be rendered Saviour, the gathering of the fruits. God protector, Mercury.
11—Epiphi	—24 June	—Month of the son of Apis, the grapes begin to ripen. God protector, Osiris.
12—Mesori	—24 July	—The name of Egypt, and so denominated by the Hebrews as well as the Arabs. It is called the country of Mesr, Mesour, or Mesraïm. Goddess protector, Isis.

To the Editor of the London Journal of Arts.

SIR,

A PATENT having been recently granted to me for purifying coal-gas, by means not hitherto used for that purpose, (and knowing your readiness to give early publicity to every new invention,) without waiting until my specification shall be inrolled, I take the liberty of addressing to you this communication, which you will notice or reject as you may think proper.

It would be superfluous to trouble you with the details of gas-making, I will only remind you with regard to the purification that it has always been an offensive and complicated process, conducted at an expence of from three-pence to a shilling per 1000 feet, according to the local price of lime, of which many hundred tons are annually required in a large work, producing a most inconvenient accumulation of refuse.

In the wet system, the vast quantity of lime-water employed, and the difficulty of disposing of it afterwards, are obvious objections: exceeded only by those of the dry system, which occupies more labourers, injures their health, wastes a great deal of gas at each change of the lime; and without the most unremitting superintendence, the quality of the gas will either be impoverished by the purification, or become infamously bad.

The greatest inconvenience of the present methods, next to the lime heap, is the ammoniacal liquor, produced by thousands of gallons in large works; which if not evaporated is usually either carted away with the ashes, or allowed to flow into the adjacent roads and drains, in both cases to the great annoyance of the public.

By my new patent process—1st. All these nuisances are effectually removed. 2nd. The expence is materially diminished. 3d. The ammoniacal liquor is manufactured into an alkali far superior in effect to lime, and less than a fiftieth part of its bulk.

I have only to add in explanation that I pass the coal-gas from the condenser simultaneously, with a stream of ammoniacal gas into a common receiver, and thence through water into the gasometer.

I have practised this method on a large scale at the works of the Birmingham and Staffordshire Company, with complete success. The apparatus is simple and cheap, the labour scarcely any, and the gas is very white, with great illuminating power. As little or no alteration will be necessary in works already established, I entertain no doubt of its general adoption.

I am, Sir,
Your obedient Servant,
J. F. LEDSAM.

Edgbaston, near Birmingham, April 20, 1827.

To the Editor of the London Journal of Arts.

On the Economy of using highly Elastic Steam expansively. By Jacob Perkins.

The diagram, figs. 1 and 2, Plate VII, will show the economy of using steam expansively, and also the method of compensating for the inequality of the pressure on the piston, which, if steam of 400lbs. to the square inch is used, and stopped off at the quarter stroke, will end its stroke at 100lbs. per inch. The diagram will also show that the motion of the piston is continually varying, while that of the crank is uniform in its motion (*a*).

From repeated experiments and much reflection, I am led to believe that there is great economy in using very high steam, and that expansively; that the higher you can practically use the steam the sooner you may cut it off. The diagram shows the gain in cutting off the steam at quarter stroke. Let the piston, which is represented by the line *k*. 1 *a*. descend to *i*. *b*., being one quarter of the stroke, with a constant pressure of 400lbs. per square inch. At this point let the steam be cut off and expand to double its volume; when it arrives at *h*. *c*. it will be exerting a pressure of 200lbs. per inch, producing a mean of 300lbs. per inch, through the quarter stroke. Let the steam again expand to double its volume, and the piston will finish its stroke at *f*. *e*. at 100lbs. per inch, giving a mean of 150lbs. per inch for each quarter, which add to the other two quarters, 400. 300. 150. 150. and the whole sum will be 1000 (*b*), giving an average pressure of 250 per square inch. It will be seen that, when the stroke is completed, the cylinder will be filled with steam at a pressure of 100lbs. per inch, which will be the same in quantity as though the steam had begun with a pressure of 100lbs. per inch, and continued all the stroke at that pressure. By using the same quantity of steam expansively, be-

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(*a*) This diagram does not pretend to mathematical accuracy; the object is merely to explain to the practical mechanic, in a sufficiently clear and concise manner, the principle of the advantage gained by using steam expansively.

(*b*) If the steam had continued the whole length of the stroke at 400lbs. per square inch, the sum would have been 1600lbs. consuming four times the steam with the addition of only 60 per cent. to the power.

ginning at 400lbs., there is a gain of 150 per cent. If the steam is used at 600lbs. per inch, and cut off at one-eighth of the stroke, 225 per cent. will be the gain. To compensate for the unequal pressure of the steam on the piston two cylinders should be used, particularly for steam-boats and pumping, where the fly should be dispensed with. With the following arrangement, it will be seen, while one of the pistons is at its greatest power, the other is acting with a diminished power.

The piston 1, fig. 1, in descending from *a* to *b*, moves in the same time through only half the space through which the crank moves, as will be seen by its path from 1 to 3. A force of 400lbs. is exerted on the square inch (that being the pressure of the steam), in the first quarter of the stroke: at this point the steam is cut off, leaving the other three-fourths of the stroke to act expansively. The piston 1, fig. 2, having completed half its stroke, when piston 1, fig. 1, begins its stroke, and consequently a compensation near enough for all practical purposes takes place.

It will be seen, that while the piston 1, fig. 1, has performed one-fourth of its stroke, that the piston 1, fig. 2, has moved from *c* to 6, performing seven sixteenths of its stroke in the same time. The mean in each quarter, from *c* to *e*, fig. 2, being 150lbs., the amount of pressure to be added to the first quarter of the stroke of the piston, fig. 1, (which was 400lbs.) is 275lbs., producing an available power of 675 lbs. at this part of the stroke. The piston, fig. 2, now moves but two-sixteenths of its stroke from 6 to *e*, and *f* to 8, while the crank moves through two of its divisions, from 6 to 8, which would, in another part of its path, move (within a fraction) with the same velocity of the piston. The piston, fig. 2, in moving from 6 to *e*, gives a power of 25lbs., being the last of the expansion which conds at 100lbs. per inch. The piston, fig. 2, in moving from *f* to 8, being the beginning of the stroke, gives a power of 100lbs.; thus a power of 125lbs. will be acting in the piston 1, fig. 1, while moving from *b*, to *d*, giving a power of 475lbs. to which add 125, will show a power of 600lbs. at this part of the stroke. The piston 1, fig. 1, now descends from *d* to *e*, being the last quarter of the stroke, giving 125lbs. of power to act with the piston 1, fig. 2, while moving from 8 to *h*, giving a power of 600lbs. add to this the 125lbs. and it will give a power of 725lbs. at this part of the stroke. The piston 1, fig, 1, now begins its stroke of 400lbs. per inch at *f*, and continues to *g*, with the same power, while piston 1, fig. 2, moves from *h* to 12 giving a power of 300lbs. to be added to the 400lbs., obtained at the first quarter of the stroke of the piston 1, fig. 1, at *f* and *g*, producing at this part of the stroke 700lbs. of power. The piston 1, fig. 1, now moves from *g* to *i*, giving a power of 475, while the piston 1, fig. 2, moves from 12 to *k* and *a*, to 2, giving a power of 125, which add to 475, gives a power of 600 at this part of the stroke. The piston 1, fig. 1, now moves from *i* to 1, being the last quarter of the stroke, giving a power of 125lbs., while the piston, fig. 2, moves from 2 to *c*, producing a power of 600; to which add 125lbs. will make 725lbs. at this part of the stroke.

By this arrangement, it will be seen, that a compensation is obtained, giving a more equable power than that which is produced by the single engine, whether high or low pressure, since it is well known, that at two points of the revolution of the crank the power ceases during at least one sixth of the time, which is the reason that so large a fly-wheel is necessary. It is particularly applicable to steam-boats, and may be used to great advantage in the double pump, as well as the balance-bob lifting pump, used in Cornwall for mining purposes, by the use of proper gearing. The present single stroke expansive engines used in Cornwall for pumping are preferred to all others on account of their economy, although they are very limited as to the extent of the expansive principle, for want of compensation, as nearly the same power is wanted to finish the stroke of the pump as to begin it.

The variation of the velocity of the piston occasioned by the compound motion of the crank and connecting rod is not taken into view in this diagram. As the connecting rod is intended to be four diameters of the path of the crank, the variation will make no practical objection, being, at its greatest value, but one-thirty-second part of its range. If the engine should be worked by a connecting rod, as is sometimes the case in steam-boats, say only one diameter of the path of the crank, the variation at each end of the stroke would amount to a practical defect, since the piston would move with nearly three times the velocity at the lowest quarter of the stroke that it would at the first quarter. Thus circumstanced, the crank must be above the cylinder.

As the law of expansion seems not yet to be settled, an arithmetical expansion has been used for this diagram, which, from its approximation to the real law, will be quite near enough for practical purposes. Many who are of the school of Tillock and Wolf, believe that the expansive power of steam depends upon heat only; while the Soho experiments are said to prove that elasticity depends simply on density, without regarding temperature, viz., that if a cubit foot of steam at atmospheric pressure weighs one ounce, 50 atmospheres of steam would weigh 50 ounces; but Dalton, who is undoubtedly much nearer the true law would make 50 atmospheres weigh but about 34 ounces.

I have no doubt that the nearer the atoms of water are made to approach each other by compression, the greater will be the repulsive action of caloric, and that in a more rapid ratio than has hitherto been allowed, especially in highly compressed steam. Its comparative density with the increase of power, diminishes faster than has been supposed even by Dalton.

To the Editor of the London Journal of Arts.

Sir,

As a constant reader of your Journal, I flattered myself that I was in possession of the knowledge of all that was new or great in the mechanical world, but I have had the mortification of finding myself in this respect mistaken, seeing that the Editors of some of the weekly mechanical magazines have out-stripped your accustomed vigilance, by stealing a march upon you, and have the honor of being the first promulgators of one of the most magnificent discoveries of the age, need I say The Perpetual Motion of Sir W. Congreve, Bart.

Fearing that most of your readers may be as much in the shades of ignorance upon the merits of this important subject, as I formerly was, I take the liberty of enclosing some extracts from the publication through which I first obtained my illumination, for the purpose of explaining the principle upon which this perpetual motion is *intended to* GO. I however refrain from noticing any of the very judicious remarks in commendation of the plan, made by the scientific Editors of the above works, as I think with you, that every one ought to have the exclusive advantage of his talents and literary exertion, and which therefore I leave to be, as I have no doubt they are, properly appreciated by their readers.

The report before me states that Sir William Congreve, has recently contrived a scheme of perpetual motion, founded on the principle of capillary attraction, which, it is apprehended, will not be subject to the general refutation, applicable to those plans in which the power is supposed to be derived from gravity only. Sir William's perpetual motion is as follows:

"Let A, B, C, Plate VII, fig. 3, be three horizontal rollers fixed in a frame; *a, a, a*, is an endless band of sponge, running round these rollers, and *b, b, b*, an endless chain of weights surrounding the band of sponge, and attached to it; so that they must move together. Every part of this band and chain being so accurately uniform in weight that the perpendicular side A, B, will, in all positions of the band and chain, be in equilibrium with the hypothenues A, C, on the principle of the inclined plane. Now, if the frame in which these rollers are fixed, be placed in a cistern of water, having its lower part immersed therein, so that the water's edge cuts the upper part of the rollers B, C; then, if the weight and quantity of the endless chain be duly proportioned to the thickness and breadth of the band of sponge, the band and chain will, on the water in the cistern being brought to the proper level, begin to move round the rollers, in the direction A, B, by the force of capillary attraction, and will continue so to move. The rationale is as follows:

On the side A, B, of the triangle, the weights *b, b, b*, hanging perpendicularly alongside the band of sponge, the band is not compressed by them, and its pores being left open, the water at the point *x*, at which the sponge meets its surface, will rise to a certain height *y*, above its level; and thereby create a load, which load will not exist on the ascending side C, A, because on this side, the chain of weights compresses the band at the water's edge, and squeezes out any water that may have previously accumulated in it; so that the band rises in a dry state, the weight of the chain having been so proportioned to the breadth and thickness of the band, as to be sufficient to produce this effect. The load, therefore, on the descending side, A, B, not being opposed by any similar load on the ascending side, and the equilibrium of the other parts not being disturbed by the alternate expansion and compression of the sponge, the band will begin to move in the direction A, B; and as it moves downwards, the accumulation of water will continue to rise, and thereby carry on a constant motion, provided the load at *x*, *y*, be sufficient to overcome the friction on the rollers A, B, C.

Now, to ascertain the quantity of this load, in any particular machine, it must be stated, that it is found by experiment, that the water will rise in a fine sponge about an inch above its level; if, therefore, the band and sponge be one foot thick, and six feet broad, the area of its horizontal section in contact with the water would be 864 square inches, and the weight of the accumulation of water raised by the capillary attraction, being one inch rise upon 864 square inches, would be 30lbs. which it is conceived, would be much more than equivalent to the friction of the rollers."

This should have been in italics in the original copy, *which it is conceived would be more than equivalent to the friction of the rollers.* It should appear then that the fact has not been proved.

The scientific Baronet has, it is said, subsequently to the publication of the above report, sent into the world a pamphlet explanatory of his discovery, in which he further adapts his principles as follows:

"The power of a wheel thus set in motion, may either be applied in the common mode, or by machinery at the end of the axis; or the wheel itself, as in fig. 4, may be made to revolve in a circular cistern of water, of any convenient diameter, being connected by an arm from the centre of the wheel to an upright revolving shaft in the centre of the cistern, so as to be connected with machinery, and produce a similar effect to that obtained by a horse mill.

It is evident that a constant accumulation of weight on one side of such a wheel as here described, and not on the other, would cause it to roll forward spontaneously in the circular path thus marked out for it; and as this progressive motion must necessarily occasion a considerable undulation in the water contained in the cistern, this undulation will raise the water in front of the wheel some inches above the level of the accumulation caused by the mere capillary attraction. If, therefore, this rise of the waves thus created be four inches above the water's level, the accumulation of water in the sponge on the descending side, including the one inch gained by the capillary attraction, would be five inches in height, and by this means the motive power of a wheel, the original power of which would be 30lbs. as calculated above, would thus be raised to 150lbs. which might probably be still further augmented by some mechanical means placed in front of the wheel to increase the agitation of the water.

Thus if a ripple so created, rose about nine inches including the capillary ascent, and were repeated every second, the periphery of the wheel would move through a space of nine inches in that period, and revolve at the rate of forty-five feet per minute, with a constant descending weight of rather more than 180lbs.; which would make the power of such a wheel rather above the power of one man; and if five such wheels were combined, so as to work round one centre, their united force would be equal to that of a one-horse power steam engine.

This mode of increasing the power of the revolving wheel in the above figure, by exciting an undulation in the water in which the wheel floats, leads to an application of a similar principle, by which the force of the waves of the sea may be applied with great effect as a moving power to ships and boats, which I shall here, therefore, explain:

Figure 5, represents the bow of a boat having a wheel of suitable dimensions fixed in front of its stem, by a strong frame work. This wheel is a hollow cylinder closed at the ends, but open all round, with its interior divided into compartments, similar to the Persian wheel, and so disposed that, on a wave rising to any height on the periphery of this circle, all that part of the wave which enters the interior of the wheel or cylinder, shall be retained in the fore-part thereof; while any part of this water, which shall find its way into the after-part of the wheel shall not be retained, but flow out again immediately; so that in case of a wave rising to the full height of the wheel, the whole of the front half of the cylinder shall be fully charged with water, while there would be no counterbalancing quantity in the after-part. The consequence of this, therefore, would be, that a constant revolving force would be kept up by a succession of waves; this force being in proportion to the breadth and diameter of the wheel, and to the height of the wave. Thus, if a wheel be six feet in diameter, and six feet broad, and the perpendicular rise of the waves be also six feet, the maximum charge or moving power of such a wheel would be about 1⅜ ton, being the weight of water contained in the front half of the wheel, and this, supposing the ship to be in motion, would probably be renewed by succeeding waves, about 20 times per minute. On an average, however, the perpendicular rise of a wave at sea, in lakes, or large rivers, could not perhaps be taken at more than from four to five feet, but this would be somewhat increased by the pitching of the vessel; the revolving power, therefore, of such a wheel might on an average be estimated at one ton, acting by repeated impulses, similar to that of the common oar or paddle; and supposing the least wave that could be reckoned upon to be from one to two feet in height, so the least probable power, in calm weather, might be taken at 5 cwt.

The velocity with which the charge of water will descend in these different cases would of course vary. Thus in the first instance, where the wheel has its full charge, the centre of gravity of this water, will be found rather above the horizontal radius, so that every charge would fall through a space of about five feet before it would discharge itself; and supposing therefore, the succession of waves were about 20 in a minute, the moving force of this wheel might be taken at 1¼ ton + 5 feet + 20, that is to say, 1¼ ton moving through 700 feet in one minute; which will be found to be about equal to the power of a ten horse steam engine. In the second case allowing for a proportionate falling off in the succession of waves, and in the velocity of the descent of the water—the power exerted may be considered as equivalent to the power of a six horse engine, and in the latter case, to that of a two horse power. A similar wheel also might be placed at the stern of the vessel with equal effect, and two or three such wheels might be applied without inconvenience on either side, being mere external appendages, by which means the first power of an enormous propelling force might be attached to a vessel without any internal apparatus, labour, or fuel whatever.

In larger vessels it is evident that a wheel of ten or twelve feet in diameter may be used instead of six feet, by which a proportionate increase of power would be gained. Thus the maximum power of a wheel twelve feet in diameter, and six feet wide, would be equal to that of an 80 horse power engine, supposing it to be charged by a repetition of waves at twenty feet per minute, and supposing the centre of gravity of each successive charge to pass through a space of 10 feet before it emptied itself. Two such wheels, therefore, would propel a very large vessel without the slightest loss of stowage or expense beyond the first cost. When moderate velocities only are required, the propelling power may be obtained direct from these wheels by furnishing them with paddles similar to the propelling wheels of a steam-boat; but where greater velocities are required, these cylinders should not themselves be furnished with paddles, but should be used merely to drive propelling wheels connected with them by machinery, so as to move at double or treble the rate of these first movers themselves.

It may be objected to this mode of propelling vessels, that the necessary undulation on the surface of rivers and seas is not always to be found. To this objection, however, it may be most conclusively answered, that in this respect the system of propelling by the rise and fall of waves, is even more general in its application than the present system of propelling ships by the wind; for whenever there is wind there must be waves; and considerable waves are frequently to be met with, even in a dead calm, which is so far a gain in favour of the new system. But there is a still more important circumstance in favour of the new system, which is, that in the latter case, the force is alike applicable to all points of the compass, whereas, the power of sails can only be applied in about twenty points out of thirty two, in which respect it obtains all the superiority of steam navigation, without its expense or inconvenience. To this also may be added it is much less liable to accident and danger from bad weather, than the system of navigation by sails."

Now Sir, the explanation above given of this wonderful invention is so satisfactory, that no one, even the most sceptical, can for a moment doubt the fact. It is certainly the most important one of this inventive age. Who could have thought that so simple a motive power which puts steam entirely in the back ground, could have been so long over-looked. I declare to you, Sir, that I can not sleep, seeing as I do, its wonderful power, and the results which will inevitably flow from this perpetual source of inexaustible power. I reflect upon it with unbounded pleasure; if I had been the fortunate inventor, I certainly must have gone mad. It is a very happy circumstance, that this most extraordinary power was discovered by one who already stood so high in inventive talent, as to be above further elevation.

It cannot be said of this, what has been said of many of the learned Baronet's inventions, viz. that they are too ingenious to answer for common use. What could be more ingenious than that beautiful piece of mechanism the perpetual clock, or his hydraulic lock? This clock is so beautiful, that I have been chained as it were to the spot, where it is to be seen in full operation, in Royal Exchange Alley. It was, however, found, that ingenious as was, this invention, it required more ingenuity than could be found to make it keep time, there certainly was no other objection to it.

The objection to the canal lock, was, not that it did not keep time, it was, that so much time was lost in getting through the locks, that it was soon found high time to abandon the plan. But in this new and interesting discovery, all is simplicity, every farmer may grind his own corn, by converting his horse mill into a Congreve perpetual motion, by simply sinking the horses path, thereby making a pond for the perpetual wheel to revolve in, this pond may be supplied from the same source which furnishes water for his cattle, and when they come to drink in the morning, the very act will sufficiently agitate the water to set all in motion, and when once in operation its own motion is enough to raise the waves sufficiently high to keep this perpetual wheel revolving, if I understand the invention, as I have no doubt I do, it is this wheel which constitutes a perpetual motion, by generating its own power. The same as if a steam engine generated heat enough by its own friction to raise sufficient steam to keep it at work. By the bye, I do not think this a bad idea, for if Sir Henry Davy, and Mr. Brunell should succeed in their liquid gas engine, they would require so little heat to raise their steam when once set in motion, which might be done by a simple lamp, its own friction, if properly transferred into the gas-holder, would generate quite steam enough to keep it in operation. Several years since, Sir W. published a very interesting pamphlet, containing a series of experiments made in generating steam, by burning with his coal, equal quantities of lime-stone, by which it was clearly proved, that a saving of half the fuel was effected, and that the steam, when generated, might by his new and very ingenious steam engine, be worked over and over again *ad infinitum* making a still further saving. I have often wondered why the worthy baronet did not bring, as I thought. this great improvement out; I now see the reason, he must have had this great project in view, which if the steam engine could be so far improved as to save all the fuel, this Congreve power would still supersede it.

I remain, Sir,
Your obedient Servant,
P. B—o.

Novel Inventions.

Perkins's Steam Engine.

We have seen this engine repeatedly in action since our last notice of it, and to all appearance giving great satisfaction to those who have visited it; there has not however, yet been exhibited any demonstration of the actual amount of power which it is capable of exerting, nor do we consider that its present situation in Mr. Perkins's factory, is at all favourable to such an experiment. The public must therefore for the present be satisfied with such inferencial proofs, of its capabilities, as may be drawn from a consideration of the amount of friction exerted upon the fly-wheel, by the weighted lever described in our former report.*

We have seen a testimonial given for some private purpose, by several respectable engineers, whose names however, we do not feel ourselves at liberty to publish without authority. It was to this effect:

"We the undersigned, having made ourselves practically acquainted with Perkins's high pressure safety steam engine, do not hesitate to state that he has established the following new and important facts in the construction of his engine. 1st, Absolute safety. 2nd, Greater economy in fuel than in any other engine hitherto invented. 3rd, The removal of all the re-action of the steam, and atmospheric air on the eduction side of the piston, without the necessity of an air pump. 4th, A new and simple flexible metalic piston, requiring no oil or lubrication whatever. 5th, A reduction of three fourths of the weight and bulk by very much simplifying certain complicated parts of steam engines, and substituting a very simple eduction valve, for the one commonly used both for eduction and induction. By which means a reduction is made in the size of the engine; a saving of powder is effected, and a diminution of friction; less wear and tear occurs, and less destructibility of materials. And lastly, the joints by Mr. Perkins's peculiar mode of connecting, are more easily made secure and tight, even with the steam at the pressure of 1000lbs. to the square inch, than the joints of the low pressure condensing engines."

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* The reader will be pleased to correct the errors of the press, in our former notice of this subject, by substituting in page 100, line 15, for lever of the *third* order, lever of the *second* order, and also in page 102, line 15, for "uncreated friction," read "increased friction."

This is all the information, that we are at present enabled to afford upon this interesting subject; the specification will not be inrolled until September, we shall then take the earliest opportunity of laying the invention before our readers with all its details, and in the mean time should any further information transpire, we shall not allow it to pass unnoticed.

Gurney's Steam Carriage.

A locomotive engine or steam carriage has been constructed by Mr. Gurney, combining the principles set forth in his specifications, given in our last number, pages 74, and 77, by which he has fully proved, that steam is capable of propelling carriages upon ordinary roads.

The circumstances under which his experiments have been tried were not such as afforded the most favourable chance of success, neither is the experimental engine itself such as should meet the public eye. Notwithstanding however, all difficulties which presented themselves, he has contrived to *go*, and that at times with considerable speed.

There remains much to be done to render this machine complete, and capable of public service, but we are not without hope, that a short time will bring it to such a state of maturity, as shall enable the inventor to appear before the public.

Miners' Safe Lamp, by J. Roberts, *of Saint Helen's, Lancashire.*

The only real objection to the use of Sir H. Davy's safe lamp for coal miners, is the inferior degree of light that it gives when compared with that given by a naked candle. This arises from two causes, namely the necessary obstructions offered by the black wire of which the cage or gauze is composed, within which the lamp is placed, and the casual obstruction occasioned by the adhesion of smoke to the inside of the cage, when the lamp is not carefully trimmed, and of smut and dust to the outside of the cage.

To diminish the obscuration occasioned by the first cause, Mr. Roberts proposes that the wire shall be kept bright and polished, by cleaning the cage every night with a soft brush and the black powder or smut which occurs in all coal mines, especially in the neighbourhood of faults: this smut is pulverulent non-bituminous coal, sufficiently hard to remove the rust from the surface of the wire, without materially wearing the wire itself.

As the lamp is at present constructed, the oil will run out of the cup or receptacle in which it is placed, if the lamp is laid in a horizontal position, an accident which frequently occurs on account of the lamp being rather top heavy. When this happens the gauze becomes smeared over with viscid oil, which causes the coal dust floating in the air of the mine to adhere to it, and in a short time to fill up more or less the meshes of the gauze. By merely shaking or tapping the lamp, the dust will not be dislodged; and if the miner attempts to clear his lamp by blowing through the wire gauze, he runs the risk of putting out the light, and after all very imperfectly clears the meshes; there is also perhaps, some risk of forcing the flame through the meshes on the opposite side, and of producing an explosion, if the surrounding air is inflammable.

In Mr. Roberts's lamp, the overflow of the oil is impossible, on account of the dome-shaped cover which surrounds the wick: the dust, therefore, that settles on the gauze, may be dislodged by a mere tap with the finger, or, what what would perhaps be better, by the application of a small brush similar to that which soldiers carry to clear the pans of their muskets, and which might be attached by a bit of small chain to the handle of the lamp.

Plate VII, fig. 6, is a section of the lamp *p*, *p*, and wire gauze *q*, *q*; *r*, *r*, a screwed cap, with a hollow dome *s*, it screws into the neck *t*, *t*, of the lamp: the dome rises a little above the wick-holder *u*, having an opening at top, to let the wick and trimming wire *v*, rise through. This dome serves to catch and retain any oil that may spill by shaking the lamp or knocking it over, thereby protecting the wire gauze *q*, from being smeared; *w*, and *x*, two locks, the former to secure the cap *g*, and the latter to secure the wire gauze *q*, from being removed.

Fig. 7, a section of the cap and dome *r*, *r*, *s*, separate from the lamp: the wire gauze fits into the cavity *y*, *y*, around the dome *s*; *z*, *z*, two of the four wires which serve to hold the wire gauze.

[The Society of Arts gave their Silver Vulcan Medal, and Ten Guineas, as a reward for this invention.]

Lever for Closing Doors.

Mr. Adcock of Lemon Street, Goodman's Fields, has invented an apparatus for closing doors, to be employed instead of spring-hinges. It consists of a bent lever attached to an axle, from which axle, an arm extends carrying a weight. A small roller affixed to the top of the door, acts against the under side of the bent lever, raising it as the door opens, which lifts the weighted arm; and the force of this weight acting by means of the bent lever, in an oblique direction against the roller closes the door, with a force that may be regulated by adjusting the weight upon its arm.

Plate VII, fig. 8, represents the apparatus attached to a door, as it would appear when viewed sideways, the door being closed. Fig. 9, represents the same raised, the door being open; *a* is the friction roller affixed to the top of the door; *b*, the bent lever, against which the roller acts. This bent lever is formed something like a rams horn, being so curved that the roller acts constantly against the under side of it, as the door swings upon its hinges; *c*, is the pivot of the axle on which the lever turns; *d*, is the weighted arm extending from the axle; and *e*, is the weight adjustable upon the arm, and thereby increasing or diminishing the force by which the door is closed.

The particular advantages proposed by the use of this lever are as follow:

1st. Its force may be varied with facility, according to circumstances, so as partly to prevent the inconveniences produced by changes of the wind, and by particular draughts, which occasion the violent jarring of certain doors, the power of whose weights or springs upon ordinary occasions are not sufficient to shut them.

2nd. It is also capable of any disposition of force which may be deemed eligible, or of being so made as to exert its greatest force upon the door while open to any particular angle, causing it to shut with an increasing or decreasing velocity, to latch violently, or merely to close.

3rd. As it acts with but little friction, it will perform its operations unheard, or without causing the least unpleasant or disturbing noise, as is frequently experienced in the modes hitherto adopted.

4th. It will be found applicable to any door opening only to a right angle with the post, and may be applied without interfering with the hanging of the door.

5th. Its construction being extremely simple, the expense will be trifling, and as it is not liable to be deranged, it will continue to act as long as its materials will last.

This lever has the desirable quality of holding the door very tight when closed, and thus resisting the wind, and acts gentler the wider the door is opened, so as not to strike with violence against any person following, as will be seen in fig. 9: the distance of the roller *a* from the

New Society for the promotion of Zoology, of which he had been chosen president by acclamation." The President concluded his eulogy by saying, "that the Fellows of the Royal Society could bear ample and honourable testimony to his enlightened understanding, correct judgment, and multifarious information."

After stating the foundation of the Royal Medals which had been announced to the Society at their anniversary dinner, last year, by the Right Honourable, the Secretary of State for the Home Department, and which, said the President, having been offered in the true spirit of Royal munificence, had been completed with that liberality that marked the acts of the august patron of the Royal Society he proceeded to state, that the first prize had been awarded to Mr. John Dalton, of Manchester, for the development of the chemical theory of definite proportions, usually called the Atomic theory, and for his various other labours in chemical and physical science.

He stated, that Dr. Bryan Higgins, Mr. William Higgins, and Richter, as having done something towards the foundations of this part of science, but, as far as can be ascertained, Mr. Dalton was not acquainted with the publications of the above, and whoever considers the original tone prevailing in all his views and speculations, will not accuse him of wilful plagiarism; but, bestowing the merit of discovery wherever it is due, Mr. D. will be still pre-eminent in the history of the theory of definite proportions. To Mr. D. might be attributed the first laying down clearly and numerically the doctrine of multiples, and the endeavouring to express, by simple numbers the weights of the bodies believed to be elementary.

The first views, from their boldness, met with but little attention, but they were discussed and supported by Drs. Thomson and Wollaston, and the scale of chemical equitalents of the latter gentleman, separates the practical part of the doctrine from the atomic or hypothetical part; Gay Lussac, Berzelius, Prout, and other chemists have added to the evidence in favor of the essential part of Mr. D.'s doctrine.

The President continued by saying, that Mr. D.'s reputation will rest upon the discovery of a simple principle universally applicable to the facts of chemistry, in fixing the proportions in which bodies combine, and in laying the foundation of the sublime and transcendental part of the science of corpuscular motion.

The President compared the merits of this gentleman, to those of Kepler, in astronomy, and trusted that the Society would allow the justice of the decision of their council, which had claimed for their countryman the first testimony of Royal benevolence.

The President announced, that the second medal on the royal foundation, was awarded to James Ivory, M. A. for his papers on the laws regulating the forms of the planets, on astronomical refractions, and on other mathematical illustrations of important parts of astronomy.

After having entered into the merits of seven papers communicated by Mr. Ivory, to the Royal Society, on the most difficult and abstruse points of science, and quoted M. de Laplace, as having borne testimony to some of their merits, he proceeded to compliment Mr. Ivory on his pursuing objects of science, which have but few admirers, and are intelligible only to a few superior minds; he then stated that all the mathematicians of the council were unanimous in claiming this reward for him, and he hoped that this reward would stimulate the activity of the Society to still retain its pre-eminence in this department of Science.

The President then proceeded by saying, the medal on Sir Godfrey Copley's foundation, had been awarded to

James South, esq. for his paper on the observations of the apparent distances and positions of 448 double and triple stars, published in the present volume of the Transactions.

The President observed, that the researches and observations of double stars, were pursued at first by Sir William Herschel, in the hope of discovering the parrallax of the fixed stars; these researches has occupied the late Sir William Herschel, for many] years, and since his death, they have been continued by his son Mr. Herschel, and Mr. South, with an instrument constructed by Mr. Troughton. The combined observations according to Mr. South, establish several important points. Such as occultations of fixed stars by each other, proper motions of fixed stars, and revolving systems in which two stars perform to each, the office of the sun and planet, several of them having revolutions which may be assigned from 53 to 1400 years. After giving a pretty extensive account of Mr. South's conclusions, the President said, he felt satisfied that the Society would concur in this vote of the council.

Mr. South had procured his instruments at a vast expense, employing them at home and abroad, trusting entirely to his own resources. In pursuing his favourite science, he must have passed many watchful and sleepless nights, sacrificing both ease and comfort in conducting his observations, the results of which had been fully communicated to the Society.

In presenting the medal to Mr. South, the President observed, that it was the oldest mark of distinction which the Society had to confer, and it was the more valuable from having done honour to so many illustrious names, and the great and extraordinary advances in natural knowledge which had been connected with it.

[*To be continued.*]

ASTRONOMICAL SOCIETY OF LONDON.

March 9th, 1827.

AT this meeting a "Notice was read respecting some errors common to many tables of logarithms," by Charles Babbage, Esq. Foreign Secretary of this Society. Mr. Babbage having lately printed a stereotype table of the logarithms of the natural numbers for the use of the Trigonometrical Survey in Ireland, for the sake of greater accuracy subjected them to eight readings and comparisons with other tables. This cautious process led to the detection of various errors, which are common to almost all the tables; those of Vega, the last impressions of Callet, and Mr. Babbage's own Tables, being all that he has found free from the errors which he specifies. The tables subjected to this examination, were those of Vlacq, Gouda, 1628, carried to ten figures; Vlacq, London, 1633; Wingate, London, 1633; Newton, in his *Trig. Britan.* 1658, to eight figures; Sherwin, London, 1726; 2nd ed. 1741; 3rd ed. 1742; Gardiner, London, 1742; Sherwin, 4th ed. 1761; 5th ed. 1770; Gardiner, Avignon, 1770; Schulze, Berlin, 1778; Gardiner, Furenze, 1782; Taylor, London, 1792; Vega, Leipsic, 1794; Callet, (stereotype,) Paris, 1795; Callet, ditto, Paris, (tirage,) 1825; Hobert and Ideler, Berlin, 1799; Delambre, Tab. Dec. Paris, 1801; Hutton, 4th ed. London, 1804, 5th ed. 1811; Vega, Leipsic, 1820; Hutton, 6th ed., London, 1822; Babbage, London, 1827.—Mr. Babbage thinks that the errors which he has detected can only be attributed to the universal system of copying which prevails in such works.

The numbers and *correct* logarithms to *seven* places are as below:

Numbers.	Logarithms.	Vlacq's last five figures.
24626	3913940	39751
38962	5906412	13420
57628	7606335	35875
57629	411	10436
63747	8044598	97412
67951	8321959	58424

From these the several tables specified may readily be corrected.

Mr. Babbage knowing that there was in the Library of the Royal Society a table of logarithms printed in the Chinese character, and which exhibits no indication or acknowledgement of its being copied from another work, was naturally desirous to compare it with European tables. On doing so, he found that in the six cases above noted, errors occurred precisely as in the European tables; thus furnishing an irresistible proof that the Chinese tables have an European origin.

There were next read two letters from Mr. Andrew Lang, to F. Baily, Esq.; one dated St. Croix, 20th of March, 1826; the other St. Croix, 30th of November, 1826. The first of these transmits an account of observations of the meridian transit of the moon's enlightened limb, and some stars preceding and following her, made at St. Croix, lat. 17° 44' 32'' north, assumed long. 64° 45' west, between September 22, 1825, and March, 15, 1826. These were sent to Mr. Schumacher at the same time, and have been published in No. 104 of his *Astron. Nachrichten.*

Mr. Lang describes the climate of St. Croix, as peculiarly favourable to astronomical observations, and speaks of the steadiness of the terrestrial refraction there. The terrestrial refraction scarcely ever varies perceptibly from the *one-sixteenth* part of the intercepted arc.

In Mr. Lang's second communication he presents a further account of the meridian transits of the moon's enlightened limb, and of moon culminating stars, observed between March 30, and November 21, 1826. He also gives a summary of his observations of occultations of μ^1, and μ^2, *Sagittarii* by the moon on the 9th of September; and of ψ *Virginis*, on the 28th of October.

Next there was read a paper, "On a new application of the method of determining the time by observations of two stars when in the same vertical, to the case of *Polaris* when so situated with respect to any other circumpolar star in the course of its diurnal revolution below the pole; By Dr. T. L. Tiarks. The author first describes the peculiarities and advantages of this method, and then presents the investigation of the formulæ of computation. If l denote the co-latitude of the place of observation, d the polar distance of the pole-star, D that of the other star α, their difference of right ascensions, and t the time elapsed from the upper passage of the pole-star to the moment of its being on the same vertical with the other; then the result of the investigation gives

$$\text{(I)} \ldots\ldots \sin(t+\phi) = \frac{\sin\alpha}{\gamma\tan l}$$

The values of γ and ϕ being determined by the following equations: viz.

$$\text{(II)} \ldots\ldots\ldots \gamma = \frac{\sin(D-d)}{\sin d \sin D \cos\psi}$$

$$\text{(III)} \ldots\ldots \tan\psi = \frac{\sin\frac{1}{2}\alpha\sqrt{(\sin 2D \sin 2d)}}{\sin(D-d)}$$

$$\text{(IV)} \ldots\ldots \sin\phi = \frac{\sin\alpha}{\gamma\tan d}$$

The author occupies a portion of his paper in tracing the limits of error, and in pointing out in what cases the method is not strictly true.

Lastly; There was read a letter from M. Gambart to the President, dated Marseilles, 30th of December, 1826. After adverting to what may be supposed his temerity in anticipating the transit of the comet seen in Boötes over the sun's disc, on the 18th of November, he presents the elements of the parabolic orbit of another comet, which are as below: viz.

Passage of the perihelion 1827	34^d·989 M.T. from midnt.
Perihelion distance	0·445
Longitude of perihelion	34° 0' 50"
Longitude of the node	191 44 33
Inclination	72 4 15

Motion retrograde.

M. Gambart exhibits a comparison of the results of these elements, and of his observations on the 27th, 28th, and 29th of December. He then adds a few remarks, which need not be recorded, and congratulates himself and astronomers generally, upon the existence and success of the Astronomical Society of London. "What," he asks, "may not be expected from so liberal an association? Happy the country where the love of science alone causes so many men of enlightened minds to combine in such an object! Happy, also, those who dwell there!"

The President read part of a private letter from M. Littrow, Director of the Imperial Observatory at Vienna, stating that His Majesty the Emperor of Austria has liberally authorized the purchase, for that observatory, of a refractor, similar in all respects to that made by Fraunhofer, for the observatory at Dorpat, and which at the death of that excellent artist was left, (so he understood the words "*des noch übrigen*") by him amongst his other instruments undisposed of.

New Patents Sealed, 1827.

To Aristides Franklin Mornay, of Ashburton-house, Putney-heath, in the County of Surrey, esq. in consequence of a communication made to him by a Foreigner residing abroad, and of discoveries by himself, for an invention of certain improvements in preparing for smelting, and in smelting ores and other substances, containing certain metals, or in extracting such metals from such ores and substances—Sealed 27th March—6 months

To Matthew Bush, of Dalmonach Printfiield, near Bonhill, by Dunbarton, North Britain, calico printer, for his invention of certain improvements in machinery or apparatus for printing calico and other fabrics—27th March—6 months.

To Bennett Woodcroft, of Manchester, in the county of Lancaster, manufacturer, for his invention of certain processes and apparatus for printing and preparing for manufacture, yarns of linen, cotton, silk, woollen, or any other fibrous materials—31st March—6 months.

To Henry Asprey Stothert, of the city of Bath, founder, for his invention of certain improvements on, or additions to ploughs—4th April—6 months.

To John Paterson Reid, merchant and manufacturer, in Glasgow, for his invention of an improvement or improvements on power looms, for weaving cloth of various kinds—4th April—6 months.

To Joseph Tilt, of Prospect-place, in the parish of St. George, Southwark, in the county of Surrey, merchant, in consequence of a communication made to him by a person residing abroad, for an invention of certain improvements in the boilers used for making salt, commonly called salt pans, and in the mode of applying heat to brine—4th April—6 months.

To Edward Cowper, of Clapham road place, in the parish of St. Mary, Lambeth, in the county of Surrey, gent. for his invention of certain improvements in printing music—5th April—6 months.

To James Shudi Broadwood, of Great Pulteney-street, Golden-square, in the parish of St. James, Westminster, in the county of Middlesex, piano-forte maker, for his invention of certain improvements in the grand piano-forte—9th April—6 months.

METEOROLOGICAL JOURNAL, MARCH AND APRIL, 1827.

1827.	Thermo.		Barometer.		Wind.	Weather.
	Max	Min.	Morn.	Even.		
MAR						
28	53	43	29,50	29,88	W.	Very high wind—Rain $\frac{1}{8}$ in.
29	50	34	29,03	29,18	W.—N. W.	Stormy—high wind—hail
30	48	34	29,20	29.57	W.—N.W.—N.	Ditto—ditto—showers
31	50	37	29,84	29,95	N.—N.W.	Fair—ditto
APR.						
1	48	40	29,94	29,90	W.	Cloudy—damp
2	58	46	29,92	29,89	N. W.	Ditto—ditto
3	57	46	29,88	29,84	W.	Ditto
4	57	44	29,90	29,89	S. W.	Ditto
5	65	46	29,88	29,84	S.—S. E.	Fair—clear
6	68	48	29,74	29,86	S. W.	Ditto morn.—cloudy rain $\frac{1}{8}$ in. even
7	63	46	29,90	30,02	N.W—S.W—W	Fair
8	61	45	30,13	30,03	N. E.	Ditto
9	64	46	29,93	29,76	S. W.	Ditto—clear
10	57	44	29,72	29,70	S. W.—N.	Cloudy—rain 1-8 in.
11	55	45	29,72	29,68	S. W.	Ditto—shower
12	54	45	29,62	29,73	S. W.	Ditto—rain 7-16 in.
13	56	43	29,86	29,97	S. W.—W.	Sun and clouds
14	59	41	29,97	29,88	N.—W.	Fair—clear
15	56	45	29,86	29,84	N.	Cloudy—showers } 1-12 in.
16	51	44	29,86	29,86	N.—N. E.	Ditto—Ditto
17	55	41	29,85	29,82	N.—N. E.	Ditto—ditto
18	46	41	29,72	29,64	N.—N. E.	Rain $\frac{1}{2}$ in.
19	53	42	29,61	29,53	N. E.—E.	Cloudy
20	56	43	29,51	29,47	E.—S. E.	Ditto—sun
21	50	43	29,41	29,48	E.—N. E.	Rain 5-16 in.
22	43	36	29,53	29,61	E.—N. E.	Cloudy—damp
23	47	36	29,58	29,47	E.—N. E.	Ditto—Ditto—slight snow
24	48	33	29,39	29,48	S.—W. W.	Fair—ditto
25	50	36	29,55	29,75	N.W.—W.	Ditto—clear—slight frost
26	58	35	29,92	30,06	W.	Ditto—Ditto—Ditto
27	62	40	30,10	20,03	S. W.	Ditto—Ditto

Hitchen, Herts.

WATSON PERKS.

D.	H.	M.	S.	
3	15	0	0	☽ in conj. with 1 α in Cancer
3	16	0	0	☽ in conj. with 2 α in Cancer
3	19	25	0	☽ in □ first quarter.
4	0	0	0	♅ Stationary.
4	11	39	10	♃'s 1st Satt. will emerge
5	0	0	0	☉ before the Clock 3′ 26″
6	0	0	0	♄ in conj. with μ in Gemini.
6	22	0	0	☽ in conj. with υ in Leo.
7	18	0	0	♂ in conj. with 2 κ in Taurus
8	22	0	0	☽ in conj with α in Virgo.
10	0	0	0	☉ before the Clock 3′ 49″
10	9	0	0	☽ in conj. with 2 α in Libra.
10	0	9	0	☽ eclipsed invisible.
10	20	25	0	Ecliptic Opposition or ○ Full Moon.
10	21	0	0	☿ in conj. with ο in Pisces.
11	5	0	0	☾ in conj. with κ in Libra
11	9	0	0	☾ in conj. with λ in Libra
11	13	33	30	♃'s 1st Sat. will emerge.
11	14	0	0	☾ in conj. with 1 β in Scorpio
11	14	0	0	☾ in conj. with 2 β in Scorpio
11	16	0	0	☾ in conj. with γ in Scorpio
12	18	0	0	☾ in conj. with ρ in Oph.
13	14	0	0	☾ in conj. with 2 μ in Sagett
15	0	0	0	☉ before the Clock 3′ 56″
15	17	0	0	☾ in conj. with β in Capri.
17	10	59	0	☾ in □ last quarter.
20	9	56	30	♃'s 1st Satt. will emerge.
20	0	0	0	☉ before the Clock 3′ 50″
29	9	49	0	☉ enters Gemini.
22	2	0	0	♀ in conj. with ο in Pisces.
25	0	0	0	☉ before the Clock 3′ 29″.
25	6	40	0	Ecliptic conj. or ● New Moon.
26	20	0	0	☽ in conj. with ζ in Taurus
27	11	50	58	♃'s 1st Satt. will emerge.
27	21	0	0	☽ in conj. with γ in Gemini.
30	22	0	0	☽ in conj. with 1 α in Cancer
30	23	0	0	☽ in conj. with 2 α in Cancer

The waxing ☽ moon—the waning moon ☾

Rotherhithe. **J. LEWTHWAITE.**

METEOROLOGICAL JOURNAL FOR MARCH AND APRIL 1827.

1827.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.	
MAR.					
26	49	28	30,10	30,08	
27	52	30	29,86	29,76	
28	48	40	29,57	29,16	,05
29	48	35	29,27	29,10	,375
30	47	32	29,58	29,30	,025
31	50	35	30,03	29,92	
APR.					
1	51	35	30,05	stat.	
2	58	40	30,00	29,97	,025
3	63	44	29,96	29,95	
4	63	38	29,98	stat.	
5	64	40	29,98	29,95	
6	68	39	29,99	29,85	
7	63	46	30,10	29,98	,125
8	65	44	30,19	30,17	
9	64	47	30,02	29,86	
10	58	35	29,78	29,77	
MAR.					
11	57	43	29,78	stat.	,025
12	52	40	29,80	29,68	
13	56	42	30,00	29,96	,25
14	57	39	30,04	30,00	
15	54	40	29,94	stat.	
16	57	42	29,94	stat.	
17	56	35	29,94	29,89	,05
18	48	35	29,83	29,73	,175
19	53	40	29,66	29,58	,1
20	53	31,5	29,55	29,50	
21	50	41	29,47	29,46	
22	47	39	29,63	29,55	,05
23	43	25	29,60	29,55	
24	45	28	29,50	29,44	
25	52	31	29,80	29,60	

LOWER EDMONTON. **CHARLES H. ADAMS.**

Lat. 51° 37′ 32″ N. Long. 0° 3′ 51″ W. of Greenwich.

LITERARY AND SCIENTIFIC NOTICES.

Picturesque, Views of the English cities, from drawing by G. F. Robson, edited by J. Britton. The second part of this work has made its appearance, containing views of seven cities, viz. Winchester, Hereford, Salisbury, Chester, Carlisle, Wells and Lincoln; together with a different view of Norwich. If beautiful picturesque representations aided by the execution of some of our first engravers, are recommendations to a work of this description, then this work carries with it the strongest recommendation to the lovers of the fine arts.

American Canal.——This grand Canal of the United States, which was begun 1817, and is now completed has been lately opened for the purposes of navigation, it connects Lake Erie, with the Hudson's River.

Lake Erie occupies in the United States, an elevated region between the Atlantic Ocean to the east, and the Gulf of Mexico on the south. The construction of a means of communication between the two seas, through the medium of this lake naturally presented itself.

No definite determination has yet been taken in regard to the second part of this communication by the Ohio and Mississipi. The canal completed is 132 leagues in length.

G. Poulett Scrope, Esq. F.R.S. &c. has nearly ready for publication, a memoir on the Geology of Central France, including the Volcanic formations of Anverque, the Velay, and the Vivarais.

In the press by H. T. de la Beche, Esq. tabular and proportional views of the super-medial and medial (Tertiary, and Secondary) Rocks; to contain a list of the Rocks composing each formation, a proportional section of each, its general character Organic Remains, and Characteristic Fossils on one large sheet.

The Emperor Nicholas has rewarded the Blind Poet Koslow, with 2000 rubles, for the translation of Lord Byron's poem of the Bride of Abydos, and the Empress presented him with a valuable diamond ring; but this is not all for encouragement of a more magnificent description was given by the same illustrious personage to the poet Nicholas Iwanowitsch Gneditch, for the translation of Homer's Iliad, into Russian hexameters, by settling upon him a pension for life of 3000 rubles.

A narrative of a journey from the Rio de la Plata, by the United Provinces into Upper Peru, and thence by the deserts of Coranja to the Pacific, will shortly make its appearance from the pen of Captain Andrews, who went out as a Commissioner from the Chilian Mining Association, to engage mines in South America.

His Majesty the King of the Netherlands, has afforded another proof of his countenance to the Fine Arts, by allotting 20,000 florins, annually from the treasury for the purchase of the best pictures produced by native artists, within the year.

The veteran Northcote of the Royal Academy, has announced as in a state of forwardness. One hundred Fables in prose and verse. Original and selected, to be illustrated with 270 engravings on wood, from designs by Messrs. N. and W. Harvey, this work it is expected will furnish a rich treat to the admirers of this department of the Arts.

Mr Sevier the sculptor is now exhibiting in Regent Street, London, a colossal statue of Christ on the Cross. The subject is supposed to be taken at the moment the words were uttered, "My God! My God! why hast thou forsaken me". The contractions of the muscles represent the figure as being in the agonies of death, but grief and resignation is depicted in the placid countenances. The talent displayed by the Artist both in the design and execution of this work is of no ordinary character, but our limits will not allow us to expatiate upon its merits; we are perfectly astonished to see such a production from so young an Artist.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LXXX.

Recent Patents.

To George Anderton, *of Chrickheaton, in the County of York, Worsted Spinner, for his Invention of certain Improvements in the Combing and Dressing of Wool, and Waste Silk.*

[Sealed 4th March, 1826.]

The subjects of this patent, are certain methods of employing and combining in the form of a machine or machines, a series of combs or heckles for the purpose of combing and straightening the fibres of wool; (we suppose principally long wool, for the preparation of worsted.)

The proposed construction of the machine, (which indeed appears to present but little novelty,) may be easily understood by any one acquainted with the engines commonly called devils, employed for the breaking or preparing of cotton and wool, in the first operations of its manufacture.

The wool having been washed and cleansed from its impurities, is to be spread out upon an endless web or feeding cloth, and being thence conducted through a pair of feeding rollers, is drawn out from between the rollers by a series of combs or heckles, affixed to the periphery of a rotatory drum, which drum is made to revolve by a band from any first mover, passing over a rigger upon its axle. The filaments of wool thus drawn from the rollers by the rapidly revolving combs, are as they pass, thrown against the points of a fixed comb or heckle, and are thereby more perfectly drawn straight. When the combs have thus become filled with wool, they are to be successively brought under another revolving double comb, (but in what way this is to be done, the specification has not mentioned), the object of which is, that the outer ends of the wool may be further straightened.

The straight ends of the wool are now to be taken hold of, and confined between leaves or flaps of wood, joined together by a strip of leather, forming a hinge; which flaps of wood with the lengths of wool pendant from them, are to be fixed to a drum or wheels, and made to revolve slowly. An axle having two combs, is to be placed near the periphery of the drum, so as to catch the filaments of wool as they pass, and these combs being made to revolve upon their axles with great rapidity, that is, one thousand times to one revolution of the large cylinder, the lengths of wool become straightened out, and fitted for slivering.

It is to be observed, that as heat greatly facilitates the operation of straightening the wool, the patentee proposes to apply heat to the machine in several situations, but particularly to the last mentioned combs, which are to be occasionally removed, for the purpose of heating, and other hot combs set in their places, the combs being made to attach to the rotatory axle by sliding into grooves.

These machines may be made in different forms, therefore the patentee claims as his invention the combing of wool by means of a series of combs affixed to a cylinder, revolving upon a horizontal axle, for the purpose of partly dressing the said wool; and afterwards completing the process, by attaching the wool to another cylinder, and bringing a rapidly revolving comb to act upon it.

[*Inrolled, May* 1826.]

To JAMES ROWBOTHAM, *of Great Surrey Street, Black-friars' Road, in the County of Surrey, Hat Manufacturer, and* ROBERT LLOYD, *of the Strand, in the County of Middlesex, Hatter, for their having Invented or found out a certain Method of Preparing, Forming, Uniting, Combining, or Putting Together, a certain Material, Substance, or Thing, or certain Materials, Substances, or Things, for the purpose of being made into Hats, Caps, Bonnets, Cloaks, Coats, Trowsers, and for Wearing Apparel in general, and various other purposes.*

[Sealed 18th April, 1826.]

THE material proposed by the patentees, to be employed for the foundations of hats, and for various other purposes, is cork; which is to be sliced into thin sheets, by means of a machine similar to those used for splitting leather; or it may be prepared by an ordinary knife, or by various other means, to which processes the patentees lay no claim.

The cork to be employed for the above purposes, is to be reduced into very thin sheets, from about an eighth of an inch to a sixteenth of an inch in substance, and out of these sheets of cork, the shapes, that is, the foundations of the crowns and tips of hats, caps, &c. are to be made; which after being properly connected at the joints are to be covered with shaggy or plush silks, such as are commonly employed for the covering of hats.

The advantages of these cork foundations, are, that the hats made of them are extremely light and flexible, are perfectly water-proof, and from the porosity of the cork, allow the vapour arising from the perspiration of the head to escape through the hat; which will be found to afford great relief to the wearer when walking, and in warm weather.

The patentees propose, not only to employ cork in the thin sheets described above, but also to cut it into narrow strips, and unite the strips together by weaving it in a loom. These strips must be reduced very thin in substance, but may be cut to any breadth that may be deemed desirable or convenient. A warp of flax, cotton, or other threads or yarns, is then to be laid in a loom, in the way practised in ordinary weaving, and the warp being opened by headles or otherwise as usual, the strips of cork are to be successively introduced as weft or shoot, in the manner that wires are introduced in weaving pile, and such kind of fabrics; the beating up being performed also in the common manner by the batten.

The materials thus woven, form a sort of cork cloth, which it is intended to cut out into the forms of parts of garments, and to attach these portions of the cloth together in any convenient way, for making them into cloaks, trowsers, and other things, which the patentees state, will be water-proof, warm, and light; and consider that these cork garments will be particularly desirable for sea-faring people, as they will effectually prevent the wearer from sinking in water.

Cork prepared by slicing into thin sheets, may be employed for a variety of other purposes, beside those above stated, particularly for coating damp walls, previously to papering them, and also for the sheathing of ship's bottoms; which objects come within the contemplation of the patentees, and are therefore claimed by them as their invention.

[*Inrolled October,* 1826.]

To Edward Garsed, *of Leeds, in the County of York, Flax Spinner, for his Invention of certain Improvements in a Machine or Machines for Heckling, Combing, or Dressing Flax, Hemp, and other fibrous materials.*

[Sealed 14th May, 1825.

This machine is designed to separate the fibres of flax or hemp ready for spinning, by means of combing, or what is technically called heckling its filaments, after the boon, or woody parts, have been broken from the outside of the stem; the flax being taken up by this machine when it has been brought into that state of preparation in which it is commonly sold by farmers and villagers in bundles, in the country markets.

Plate VIII, fig. 1, is a side view of the machine; *a*, *a*, are two drums of equal diameters, or they may be merely circular rims or wheels, turning upon their axles, in the frame or standard of the machine; *b*, *b*, is an endless band or chain, or several chains passed over the two drums or rims, which endless band carries a series of heckles, *c*, *c*, c. The bunch or strick of prepared flax is spread out flat, and being confined between clamps or holders, is then suspended by cords from the standards *d*, as at *e*, the ends of the flax hanging down so as to be acted upon by the traversing heckles *c*, *c*, *c*, as they pass under it.

Rotatory motion being given to one of the drums *a*, by means of a band from a steam-engine, or other first mover passing over a rigger upon the axle of the drum, the endless band or chain *b*, is carried forward, and with it the heckles *c*, the points of which as they pass enter between the filaments of flax, pendant at *e*, separating the filaments, and combing them out straight.

In order to keep the heckles in the same course, rails *f*, *f*, are introduced on each side of the machine, and skaits *g*, *g*, *g*, are affixed to each end of the heckle-frames, which slide upon the side-rails *f*. There are elevated pieces, both at the back and front of the heckle-frames, which regulate the depth, to which the points of the heckles are allowed to pass into the flax, and the tow which is combed off the flax, and collected in the heckles is removed as the heckles pass to the under side of the machine, by a falling lever called a stripper *h*, *h*, seen hanging down from the heckles below; which tow being thus removed, descends on to the endless web *i*, *i*, and is conducted away.

For the purpose of lowering the strick or bunch of flax progressively, so that all parts of it may be acted upon by the heckles, the frame *e*, which holds the flax, is suspended by a cord from the standard *d*, and this cord being passed over a pulley, its end is made fast to the wheel *k*, which wheel being moved very slowly by a band and rigger, connected to the train of wheels on the side of the machines, causes the flax to be progressively lowered, and its upper part brought down and submitted to the operation of the heckles.

The mode of confining the end of the suspending cord, is by placing the stick or rod, to which the end of the cord is attached, between the teeth or pins of the wheel *k*, and by shifting the rod, the strick of flax may be drawn up and lowered to any desired height. There are appendages to this wheel, which are capable of adjustment, such as a catch *j*, to hold the rod and cord, while the strick of flax is removing, and another strick being placed in the frame in its stead. There is also a shield *l*, for regulating the position of the rod, which is to be fixed as a guide for dropping the rod into the teeth after every charge, and when the wheel has advanced so far round as to allow the rod to be drawn out of the teeth of the wheel, by the weight of the strick and its clamps; the rod then falls upon the catch *m*, and by its fall gives notice that the strick of flax has reached the bottom. The strick may now be removed from the machine, and the combed ends being turned the reverse way, and confined with the clamps, the uncombed part of the flax is submitted to the action of the heckles as the former, by which means the entire length of the flax becomes perfectly combed and prepared for spinning.

There are certain parts of this machine which have been used before for the heckling, combing, or dressing of flax and hemp, the patentee therefore wishes it to be understood that he claims only the novel parts, which he expresses in the following terms:—"I claim—1st. The fixing of any required number of heckles, or combs, and their appendages, upon a flexible or endless sheet, or on a wide strap, or upon a chain or number of chains or narrow endless straps, revolving upon two or more drums or rims. 2nd. The lowering wheel and the apparatus combined and to be used therewith, for lowering and bringing into action the flax or other material, whilst the same is being hackled or combed, whether such lowering or bringing into action be effected by a sliding motion in grooves, or by the motion of a lever or levers, carrying the holders, provided the motion be given to such lever or levers, by means of the lowering wheel, the lowering cord or chain, and its lowering pins. 3rd. The stripper and the apparatus combined therewith, for stripping or doffing the tow from the heckle pins."

[*Inrolled, November*, 1825.]

To JOSEPH CLISELD DANIELL, *of Stoke, in the County of Wilts, Clothier, for his Invention of certain Improvements in Machinery, applicable to the Weaving of Woollen Cloth.*

[Sealed 13th October, 1825.]

THE improvements proposed by the patentee apply to what are usually denominated power-looms, that is, looms which are actuated by the power of steam or water. There are two objects intended to be accomplished by these improvements, first, a more powerful beating up of the weft or shoot in weaving woollen cloths, than has hitherto been effected in power looms; and secondly, a mode of lifting the warp, or chain as it is called, so as to throw a much greater portion than usual of the weft, or shoot on to the face of the cloth; for the purpose of increasing the quantity of pile, and thereby improving the appearance of the cloth when finished.

The beating up of the weft, which in ordinary looms is produced by the hand of the weaver, who brings the lay forward with two smart strokes, which strike the reed against the weft thread, is, in the present improved loom, effected by means of a spring or springs attached to the breast beam, and to the lower bar of the lay.

The movements of the loom are produced by rotatory wheels with cams or tappets acting upon the different parts of the machinery, as may be seen by reference to several patent power-looms described in our Journal, (see Bowman's patent, Vol. II, Roberts' Vol. VII, Buchanan's, ib. and others in our subsequent volumes). The present patentee, however, does not claim the modes of moving the operative parts of the loom, but simply under this head, the spring or springs, for drawing the lay forward, with considerable force.

In order however, to explain this invention, it is necessary to say, that immediately beneath the lay, there is a rotatory cam, which as it revolves, acts against a piece extending from the under part of the lay, and by that means, forces the lay back, and retains it in that position while the shuttle is passing across, between the sheds of the warp. As soon as the shuttle has passed, the cam escapes from the lay, and allows the spring connected to the lay, and to the breast beam, to pull the lay forward with considerable force, which causes the reed to beat up the weft as above said.

Various kinds of springs may be employed for this purpose, provided they are so placed as to draw the lay toward the breast beam. A long blade spring is proposed, which is made fast to the breast beam at one end, and is attached to the lay near the middle, by a swivel joint; or, instead of being immediately attached to the lay, two other blade springs may be affixed to the lower bar of the lay, and these attached to the acting end of the former, which it is considered would soften the beating up stroke, and yet give all the required force. Or instead of these blade springs, helical wire springs might be employed, one end of the spring being secured to the breast beam, and the other to the lay.

The improved mode of lifting the warp, is by the employment of three headles as the harness, one third of the warp threads being tied up by each headle, and these being made to rise one at a time in succession by the movements of the machinery, previously to every throw of the shuttle, cause only one third of the warp threads to be above the weft, while two thirds are always below it. By this arrangement a greater portion of the weft is thrown on to the surface of the cloth on the right side, and the means afforded of drawing out a larger quantity of pile, which greatly improves the face of the cloth, when the giging, shearing, and dressing, has been completed.

[*Inrolled April,* 1826.]

To William Grimble, *of Cow-cross Street, in the County of Middlesex, Gentleman, for his Invention of certain Improvements in the construction of Apparatus for Distilling Spirituous Liquors.*

[Sealed 14th May, 1825.]

The apparatus proposed as the subject of this patent, is intended to be adapted to the ordinary still, and to be interposed between the head of the still, and the worm tub, for the purpose of catching the aqueous parts of the vapour, driven off in the process of distillation, and conducting them back again into the still while the alcoholic vapour or spirit is allowed to pass into the worm, and become condensed as usual.

Plate VIII, fig. 2, represents the apparatus partly in section; *a*, is the head of a still, on to which a square rim *b*, *b*, is fitted and secured air tight by luting; *c*, is a plate to which the rim is made fast. This plate is perforated with holes, from each of which a pipe *d*, *d*, *d*, rises, and through these pipes the vapour proceeding from the still is intended to pass into the close box *e*, *e*.

Within the box *e*, there are a series of tubes *f*, *f*, through which the atmospheric air is allowed to blow, for the purpose of presenting a cold surface to assist in condensing the vapour as it rises into the box. These tubes may be carried in any direction through the box, or may be coiled round within it, as may be found most convenient, the air of the atmosphere being allowed to pass through the tubes freely.

The bottom of the box *e*, is made convex, for the purpose of conducting the condensed vapour to the corners of the box, where there are tubes *g*, *g*, by which the liquid flows down into the still below. The lower ends of these tubes *g*, are bent round, in order to enable them to hold a small quantity of the condensed liquor, which prevents the vapour from the still rising up those tubes.

The apparatus so constructed and attached to a still, causes the aqueous parts of the vapour, arising from the distillaton to be arrested in the box *e*, and conducted down into the still below, while the alcoholic vapour which is not condensed by the cold air tubes, passes off by the pipe *h*, to the worm in the worm tub, where it becomes condensed in the usual way. A thermometer *i*, is proposed to be inserted into the box *c*, for the purpose of shewing the temperature, and enabling the director to regulate his fire; or, in place of this, a pyrometer may be placed within the head, and its outer extremity made to act upon certain levers connected to an index and dial plate, for the purpose of shewing the degree of heat within.

The form of the apparatus, and the precise number of pipes, is a matter of little or no consequence, the patentee proposes it to be square, and to have 672 pipes, but does not confine himself to that particular shape, as it might be round or of any other form; neither is that exact number of pipes essential, as a greater or less number may be employed, according to the size of the apparatus.

[*Inrolled November*, 1825.]

To THOMAS WORTHINGTON *the Younger, and* JOHN MULLINER, *both of Manchester, in the County of Lancaster, Small-ware Manufacturers, for their Invention of, and Improvements in, the Loom or Machine used for the purpose of Weaving, or Manufacturing of Tape, and such other Articles to which the said Looms or Machines may be applicable.*

[Sealed 21st June, 1825.]

THIS invention consists of certain appendages to be applied to a loom for the purpose of accommodating the delivery of the warp threads to the speed with which the work is taken up upon the beam or roller. The improvements are designed principally for, if not exclusively applicable to those looms which are employed for the weaving of tapes, and such narrow goods or small-wares.

Plate VIII, fig. 3, is a side view of the frame-work of a loom, intended to be worked by the power of steam or water, in which representation the novel features are shewn, but many of the old parts are omitted to avoid confusion; *a*, is a rigger upon the main shaft *b*, which receives its motion by means of a band from a steam engine; *c*, is the warp roll or bobbin from which the yarn or thread is drawn, that produces the warp; *d*, is the work roll or beam, upon which the work ultimately is taken up as it becomes woven.

The course in which the warp threads are conducted from the roll, *c*, is shewn by the line *e*, *e*, *e*. The warp having proceeded upwards from the roll *c*, passes over the rollers *f*, and *g*, and under the roller *h*, then up again over the roller *g*, and downwards under the roller *i*, from whence it proceeds on through the heddes *k*, and lay *l*, where the shuttle passing to and fro between the open warp, weaves the fabric; which being conducted over the breast beam *m*, proceeds round the rollers *o*, and *p*, to the work-roll *d*, before mentioned.

A toothed-wheel affixed to the shaft *b*, on the opposite side of the loom, takes into and actuates another wheel at the end of the tappet-shaft, (neither of which however are shewn in the figure,) because they form no part of the present improvement. By means of this gear, the evolutions of the loom are performed in the way that power looms are commonly put in action.

At the end of the tappet-shaft there is an endless screw *q*, which takes into pinions on the ends of the lateral shafts *r*, and *s*. At the reverse end of these shafts, there are also other pinions: that of the shaft *r*, taking into the bevelled toothed-wheel *t*, upon the axle of the roller *p*, that of the shaft *s*, taking into the bevelled wheel *u*, upon the axle of which there is a pulley with a band extending round the roller *d*.

It will now be seen that the rotation of the tappet-shaft *q*, actuated as above described, causes the endless screw to turn the two lateral shafts *r*, and *s*, the former of which drives the wheel upon the axle of the roller *p*, and the latter the wheel *t*. The particular intention of the rollers *o*, and *p*, will perhaps be understood by quoting the words of the specification, which says—"The tape or cloth thus passed from the shuttle through the apertures in the frame goes under the roller *o*, and then returns between the rollers *p* and *o*, and over the last mentioned roller, whence it descends to the beam *d*." This description of these rollers does not set out their object in a very intelligible manner, we presume however, they are intended to produce tension in the work.

It may be necessary here to observe that as the loom is designed to weave tapes, and such narrow articles, whenever we have spoken of a roller, we are to be understood as meaning a narrow roller, of which there are a series upon each shaft extending across the machine, answering to the several warps and tapes placed along the front of the machine, and woven at the same time; and that as respects the roller *o*, a series of these rollers are connected together in one line by their axles, fitting into each other by means of sockets, and they are respectively made to press upon the rollers *p*, by small weights and cords hanging down from their several axles.

The wheel *t*, and roller *p*, turned as above described by the lateral shaft *r*, gives tension to, and draws down the work; and the shaft *s*, turning at the same time, actuates the wheel *u*, which by means of the cord or band, draws round the work-roll *d*, and thereby causes the work to be taken up, and the cord or band from *u*, to *d*, being enabled to slip, prevent any undue tension from straining the work.

The delivery of the warp is regulated by a weighted lever *w*, at the back of the loom in the following manner. The bobbin *c*, from whence the warp threads are drawn, is held tight by a cord *x*, which is fixed at its lower extremity, to the frame-work of the machine; and proceeding upwards is passed round a pulley *y*, attached to the bobbin *c*, and over the pulley *f*, to the end of the lever *w*, where it is made fast, and the weight of this lever drawing the cord tight, causes the bobbin *c*, to be prevented from turning. As the weaving proceeds, the draft of the warp *e*, causes the roller *h*, to be drawn up, which raises the lever *w*, and thereby slackening the tension of the cord *x*, allows the bobbin *c*, to turn upon its axis, and give out the required supply of warp, which enables the weighted roller *h*, to descend again, and with it the lever *w*, and consequently the cord to be again drawn tight, and the bobbin held fast until a further supply of the warp is required.

[*Inrolled December*, 1825.]

To John Frederick Smith, *of Dunstan Hall, Chesterfield, in the County of Derby, Esq. for his Invention of certain Improvements in Machinery, for Drawing, Roving, Spinning, and Doubling Cotton, Wool, and other fibrous substances.*

[Sealed 21st June, 1825.]

The subjects described in this specification, are a can with two moveable ends, and a bobbin composed of several pieces which take apart.

As respects the can, it is a cylindrical vessel of tin, of the kind usually employed for receiving the rovings of cotton, &c. from the machines: and the peculiar novel feature is, that both the ends of the can are made capable of being removed, instead of one end only as usual, by the ends having rims which fit into the cylinder, like the lid of a tin saucepan. These ends the patentee calls false bottoms.

The bobbins are made by sliding one tube of metal within another, similarly to the tubes of a telescope, the outer tube forming the barrel of the bobbin, and one of the ends sliding on, and off, in the same way.

These are the improvements in machinery for drawing, roving, spinning, &c. which constitute the subjects of the present patent, and the claims of the patentee to novelty of invention are—"1st. A can for drawing and roving with two false bottoms fitting equally into each end; one of the said bottoms being removed during the process of roving the fibrous substances in the can." The ingenuity of this part of the invention being shewn, the reader is left to discover its utility by the exercise of his own imagination. The second claim is "a bobbin made of several parts, in such manner as to be capable of being taken to pieces, after any fibrous substance has been wound upon it, and entirely withdrawn from the said fibrous substance without disturbing the arrangement which was given to such fibrous substances upon the bobbin."

[*Inrolled December*, 1825.]

To JOHN YOUNG, *of Wolverhampton, in the County of Stafford, Cooper, for his Invention of certain Improvements in the Construction of Locks for Doors, and other purposes.*

[Sealed 14th May, 1825.]

THE intention of the patentee, is to produce a safe lock for doors, draws, &c. upon a more simple and cheap construction than any hitherto made, possessing the like security. There is in this improved lock, one rotatory tumbler, and one lever tumbler, both of which must be placed in certain positions at the same moment, in order to pass the bolt, and the difficulty of doing this by means of a pick-lock, or by any instrument except the true key, constitutes the security of the lock.

Plate VIII, fig. 4, shews the interior of the lock, the face-plate being removed, and the bolt shot out as when locked; *a*, is the circular tumbler, which turns upon the central pin, and is pressed forward by a forked spring *b*, behind. On the face of the tumbler there is a pin, which projects forward, and passes into a hole *c*, in the bolt, when locked, and holds the bolt securely. In order therefore, to shoot the bolt back, the key when introduced into the lock, forces the circular tumbler back, and withdraws the pin. There is a small staple *d*, fixed on the plate of the lock, beneath which the tumbler *a*, acts, and the tumbler can only be pressed back and passed under this staple when the notch cut in its side is exactly opposite to the staple as seen in the figure.

The lever tumbler is represented by dots at *f*, and is raised by the keys to such an elevation, as shall keep both the pins *e*, *e*, (which stand out from the back of the tumbler and are shewn by dots), free from the notches on the upper and under side of the bolt. In this position of the tumbler, the bolt is enabled to slide back, but if the lever tumbler was lifted to a greater or less elevation, the bolt could not be moved.

[*Inrolled November*, 1825.]

To JEAN JACQUES SAINTMARC, *of Belmont Distillery, Wandsworth Road, Vauxhall, in the Parish of St. Mary, Lambeth, in the County of Surrey, Distiller; for his new Invented Improvements in the process of, and Apparatus for Distilling.*

[Sealed 28th June, 1825.]

THE object of the patentee, is to produce alcoholic spirit from the wash or fermented liquor prepared for distillation, by submitting it to one operation only. In order to effect this, an apparatus is constructed above the furnace, consisting of ten chambers, which are to be occupied with wash, and the heat passing upwards from the lower chambers in succession, is intended to heat the chamber next above, and produce that ebullition which shall drive off the spirit. There are openings from one chamber to the other, through which the vapour or spirit is allowed to rise, and in doing so, it in several instances, passes through the wash in the vessels above, and becomes condensed again and again, the particular intention of which is, that the aqueous vapour shall be perfectly separated from the alcoholic, and that the spirit shall be discharged at top of the vessel into the worm pipe, in a highly concentrated state.

Plate VIII, fig. 5, is a section of the apparatus; *a*, is the furnace; 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, the several chambers, in which the wash is placed up to the dotted lines. The wash may be introduced by the pipe *b*, into the chamber 8, and passing from thence through the bent pipes *c*, *c*, *c*, flows into all the lower chambers; each chamber being furnished with a cock to ascertain the level of the wash, and each bent pipe *c*, also with a cock to shut off the supply of wash when the lower vessel is filled.

The vapour evolved by ebulition from the chamber 1, passes up the pipes *d*, *d*, *d*, and down between those pipes, and their covers, into the wash in the chamber 2, where it becomes condensed, and the vapour arising from the chamber 2, passes in like manner into the chamber 3, and is also condensed there. The vapour evolved in this chamber 3, collects in the dome of the chamber 4, and proceeding upwards through the pipe *f*, and down between the pipe and its cover, the alcoholic part ascends to the next dome of the chamber 5, and the aqueous part descends through a pipe *g*, into the wash below, in the chamber 3.

In this way the lighter spirit rises through the domes of the several chambers, and passes off by the pipe *h*, to the worm tub, the heavy portions which become condensed run down into the wash in the chamber beneath. There are other pipes *i*, *i*, *i*, leading from several of the vessels to the top of the apparatus, for the purpose of conducting the spirit that may be evolved from the wash in the chambers 4, 5, 6, &c. through the pipe *k*, to the worm tub.

The apparatus is to be furnished with various pipes and cocks, for proving the strength of the spirit, and drawing off the faints; and man holes are to be made in all the chambers, for the purpose of gaining access to their interiors for clearing and other purposes.

Another construction of the apparatus is proposed in which the whole is enclosed in a vessel containing wash; but the patentee says that it may be constructed in several other ways, and that he does not confine himself to the ten chambers described above, but employs a greater or less number of chambers as circumstances may require, the invention consisting in placing chambers one above the other; in such manners, that the vapour evolved from the lower chambers, may pass through the wash of the upper chamber, and being there condensed shall separate its pure spirit from the aqueous parts. Another important object to be obtained by this arrangement, is that the fire comes in contact with only a small portion of the wash, and therefore the flavour of the spirit is not subject to be effected by the fire, as is the case in the ordinary stills.

The drawing accompanying the specification, is only to be considered as a diagram exhibiting the patentees intention, and not as a representation of a perfect apparatus.

[*Inrolled December,* 1825.]

To William Hurst, *Gentleman, and* Joseph Carter, *Cotton Spinner, both of Leeds, in the County of York, for their Invention of Apparatus for giving a new motion to Mules and Billies.*

[Sealed 16th July, 1825.]

This invention is intended to be applied to such mules and billies for spinning wool, as are put in operation by the power of steam or water, instead of being worked by manual labour. The patentees say that their invention consists, "in causing the carriages of mules and billies, to stop when the length of slubbing is taken, and to remain stationary for a short time, till the operation of twisting the slubbing is completed, and then to move on again to its usual destination, for the purpose of drawing and twisting the slubbing."

The description of this invention, as given in the specification, is far from clear; indeed it is so deficient in information, that we are compelled to guess at the mode by which the patentees intend to carry their objects into effect.

The mule carriage upon which the spindles are mounted as usual, after receding a certain distance, sufficient to draw off the required lengths of yarns or rovings, from the stationary cops, is then made to stand still, by some part of the machine striking against a click, which kept what is called a scroll in gear with a rotatory toothed-wheel, and by means of which the mule carriage was moved backwards. While the carriage is thus stationary, the spinning of the yarns or rovings continue, and a small lateral rod connected in some way with the spindles, being made to revolve, causes a cam piece to slide along the said rod, (by means of a screw we suppose,) until the campiece is brought under the bent end of a vertical bar, attached to the side of the carriage.

The carriage being now intended to resume its receding movement, the cam-piece raises the said vertical bar, which being connected to several other levers, causes the scroll before mentioned to be thrown again into gear with the toothed-wheel, and the movement of the mule carriage to be resumed, and to proceed to its destination, stretching the roving or yarns in the way they are usually elongated.

The invention does not extend to the taking up of the spun yarns, or to any other parts of the operation of spinning, except those above mentioned, of which we should have felt happy in giving a more satisfactory explanation, if the descriptive part of the specification had enabled us.

[*Inrolled January*, 1826.]

To William Hurst, *and* Henry Hurst, *both of Leeds, in the County of York, Manufacturers, for their Invention of certain Improvements in the art of Scribbling and Carding Sheep's Wool.*

[Sealed 16th July, 1825.]

These improvements consist in the first place, in combining in one machine what is called the tenter hook willy, with the ordinary scribbling cylinder, for the purpose of breaking or tearing the wool in its first state, and then conducting it immediately into the scribbling engine without the intervention of manual labour, there to be further separated by the rotatory cards. The second feature is a contrivance by which the wool, after it has been once scribbled or carded, may be taken off in sheets, and placed upon the feeding cloth of another machine, with the end of its fibres crossed, or in a contrary direction to that in which they had been previously carded.

As there is scarcely an iota of novelty in the form or construction of the consistent parts of this machine, the improvements will be perfectly understood by description without figures, but the reader may perhaps be in some degree assisted by inspecting Plate XVI, fig. 1, of our preceeding volume.

The wool in its rough state, is spread out upon an endless feeding cloth, stretched between two rollers, and this cloth being gradually moved forward by an attachment to the rotatory parts of the machine, the wool is passed between guide rollers, and brought under the operation of a rapidly revolving cylinder, in the periphery of which a great number of tenter hooks are fixed. There are also placed around, and nearly in contact with this cylinder, several small rotatory cylinders having tenter hooks likewise in their peripheries, which take hold of the wool, and as they revolve, tear or separate its fibres. Thus far, this machine is both in construction and operation, similar to the ordinary tenter hook willy.

Immediately following this, and mounted in the same frame, is a scribbling or carding engine of the ordinary construction, which receives the wool from a small tenter hook cylinder, placed between the willy, and the scribbling engine; the principle cylinders of both being sufficiently contiguous, the former to deliver the wool to the intermediate cylinder, the latter to receive it therefrom, and above the intermediate cylinder, a rotatory fan is placed, which by its rapid revolution blows the wool from the cylinder of the willy, on to the intermediate cylinder, by which it is communicated to the scribbling engine.

The wool is now operated upon in the scribbling engine, by a series of rotatory cylinders covered with cards, (wire brushes) which are placed round the periphery of the principal card cylinder, and the operation of scribbling or carding, is performed in exactly the same way as usual, the wool being struck off the last cylinder by a doffer comb, in the ordinary way, from whence it is received on to the periphery of a plain wooden roller, and wound thereon, being pressed on the top by a weighted roller, in order to make the fibres of the wool adhere in a compact sheet.

In order to effect the second object, the wool which now covers the periphery of the plain roller, is to be cut off straight in the direction of the axis of the roller, and being thence taken in large sheets, is placed upon the feeding cloth of the next machine, by the hands of the workmen, who turns the sheet round placing the breadth of the wool as it came out of the former machine, lengthwise on the feeding cloth of the succeding machine. By these means the position of the carded fibres are now reversed, and an object obtained in the process which is very important and desirable.

It is to be particularly observed, that the entire circumference of the plain roller last described, must be exactly equal to the width of the feeding cloth of the engine in which the sheet of wool is to be next carded or scribbled, and a notch or groove made along the roller, is intended to point out the place at which the wool is to be cut off, in order that the sheets which are taken successively therefrom, and transferred to the feed cloth of the other engine, may be all exactly of the same size.

The claims of the inventors as to patent right, are stated to be in the combination of a tenter hook willy, and a scribbler in one frame, in such a manner as to make the former feed the latter, without the intervention of manual labour; and secondly, the application of a plain roller to the scribbling or carding machine, of a circumference, exactly equal to the length of the feed rollers, which are to receive the sheet of wool in the succeeding scribbling, or carding engine.

[*Inrolled January*, 1826.]

To THOMAS SITLINGTON, *of Stanley Mills, in the County of Gloucester, Engineer, for his Invention of certain Improvements in Machinery, for Shearing or Cropping Woollen or other Cloths.*

[Sealed 16th July, 1825.]

THE machine, which constitutes the subject of this patent, appears to be a new arrangement or combination of parts of other machines, heretofore commonly employed for the shearing or cropping the pile of woollen cloths. The peculiar features of novelty proposed are—1st. The adaptation of a cast iron frame, intended to support the elastic bed or cushion, upon which the cloth is shorn, by means of which a greater degree of stability is given to the bed, than in other machines; and it is prevented from warping or casting out of its true level. This also allows of straight knives, of double the usual length, being employed in the machine. 2nd. The form and construction of the carriage, upon which the knife and ledger blade, which forms the shears are mounted, and the mode of adjusting the blades to each other. 3rd. The manner of giving an oscillating motion to the knife, by means of a travelling rotatory crank. 4th. The contrivance for adjusting the cutters to the surface of the cloth; and 5th. The wooden rails on the sides of the machine, for raising and lowering the elastic bed.

Plate IX, fig. 1, represents a side view of the machine; *a, a, a,* is the frame work or standards supporting the whole; *b, b,* the roll upon which the cloth is wound, for the purpose of being shorn. This roll is mounted in the standards of the machine, and prevented from revolving by a ratchet and click, attached to its end. The cloth is carried up, and passed over the elastic bed *c*, *c*, and being made fast to a roll similar to *b*, on the opposite side of the machine, is tightened by raising the side wooden rails *d*, *d*, which may be done by a ratchet wheel and lever, not shewn in the figure.

The carriages *e*, of which there are two, as represented in the figure, are made to travel along the machine, over the bed, by their wheels *f*, *f*, running upon the beads or rails, on the upper edge of the side frames *a*, and the shears being put in motion by rotatory cranks, as the carriages proceed, cause the pile of the cloth to be cropped or shorn from list to list.

The operating parts of the machine are put in motion by a band from a steam engine or other first mover, passed over a rigger at the further end of the shaft *g*, and the shaft being thus made to revolve, turns the wheel *h*, and causes the endless cord or band *i*, *i*, *i*, which is carried round the pullies *k*, *k*, of the shear carriages, and over the tension roller *l*, to traverse continually. This traversing of the cord *i*, turns the pullies *k*, *k*, very rapidly round, and a crank upon the axle of each of these pullies being connected to rods *m*, *m*, cause the knives or cutters *n*, *n*, to vibrate, which acting against ledger blades in the way that cloth shears are commonly made to act, produce the effect of cutting or cropping the pile on the surface of the cloth, as the cutter carriages advances.

Upon the shaft *g*, there is an endless screw, which takes into the toothed-wheel *o*, on the upright shaft *p*, and at the top of the shaft *p*, there is a bevelled toothed-wheel actuating a corresponding wheel on the axle of the pulley *q*. It will thus be perceived, that the rotation of the shaft *g*, by means of this gear, causes the pulley *q* to turn slowly, and an endless cord or band *r, r, r,* passed round the pullies *q,* and *s,* and attached to the carriages of the shears, by means of these rotatory pullies, cause the shears to be slowly drawn across the surface of the cloth from list to list, and the cloth to be shorn by the vibratory action of the knives.

The cast iron horizontal frame, which supports the elastic bed, is shewn at *t, t,* and is designed (as abovesaid) to hold the bed firmly, and prevent its warping. The carriage is constructed with several jointed parts, which by means of levers, enable the shears to be raised off the cloth without removing the carriages, and also admit by means of screws, of adjusting the knife and the ledger blade to each other, and to the surface of the cloth.

The patentee claims as new, and his invention—1st. The cast iron horizontal frame, which supports the elastic bed. 2nd. The form of carriage, and bars for adjusting the ledger blade, and oscillating knife. 3rd. Giving motion to the knives by the travelling crank. 4th. Manner of adjusting the ledger blade to the cloth; and 5th. The two wooden rails on the sides of the elastic bed

[*Inrolled January,* 1826.]

Original Communications.

Albert's Military Oven.

In times like the present of profound peace, and amicable intercourse between us and our continental neighbours, we may look with calmness, and even admiration upon ingenious inventions, which were originally designed as instruments to effect our overthrow. Indeed we should studiously inform ourselves of all the devices which might in the event of a political rupture, be made subservient to our own defence, or, in the hands of an enemy, be employed to our detriment. With this view, we are about to introduce to our reader, an apparatus designed originally to bake bread for the use of the French Army, during its march in the memorable Russian campaign, under the Emperor Napoleon. The invention is a travelling oven, constructed upon a two wheeled carriage, to be drawn by one or more horses, like light artillery or ammunition waggons, and is intended to bake bread as it proceeds along the road. This apparatus was invented by our venerable friend and occasional correspondent M. Albert, of Paris, who also invented, and intended to employ in conjunction with this, the portable corn-mill, called the French Military Mill, which has been so much spoken of, (see the Transactions of the Society of Arts, Vol. XXXV, and Devereux's patent, Vol. IX, page 393, of our Journal.)

The apparatus in question, was first introduced to the notice of the French Government in April, 1813, by M. Albert, at that time an officer in the National Guard. The oven being completed, and mounted upon two wheels for the purpose of more conveniently travelling in bad roads, or over hilly and rough mountainous countries, was submitted to experiment under the direction of the Commissioners of the Corp of Military Engineers, and put in actual operation, baking bread as it travelled a distance of three miles through the city of Paris, and was found to perform perfectly to the satisfaction of all who witnessed it.

Plate IX, fig. 7, is a back or end view of the apparatus; fig. 8, a section taken longitudinally through the middle. The oven was constructed of plates or sheets of iron, rivetted together, which formed the sides, ends, top, and bottom, shelves, furnace, flues, and chimney. It was cased all round with wood to prevent the radiation of heat, and the spaces between the iron and the casing, were filled with sand, and being mounted upon two wheels with a frame and shaft for the horse, as shewn in the figure, was in a state fit for travelling and operation.

a, is the furnace with feeding door behind, and gratings underneath to admit air; *b*, *b*, *b*, the flue passing under, over, and round the oven, and ultimately discharging the smoke and other vapour into the chimney *c*, which should be furnished with a damper to regulate the heat; *d*, represents a part of the packing of sand between the oven and its casing as before mentioned, to prevent the escape of the heat; *e*, *e*, *e*, are shelves within the oven, for the reception of the loaves of bread, or pans of victuals which are to be introduced at the doors *f*, *f*, seen in the back view; *g*, *g*, *g*, *g*, are apertures with stoppers through which the process of baking may be watched without opening the oven doors. Through small pipes coming from the interior with cocks, the steam may be allowed to escape, and which are to be opened as occasion shall require. The oven is mounted upon the carriage, and may be supported with spring bearings if required. Ordinary light cart wheels are attached to the axle-tree, and a hurdle is suspended by chains under the carriage at *h*, for conveying the fuel, which consists of small billets of wood. The implements necessary for the use of the oven, may be attached to the sides and under part of the vehicle, such as the peel, fire-shovel, broom, mop, pail, and any other necessary appendage. This oven, when in operation contained forty-eight loaves, or ninety-six rations, of military bread, which were baked in less than an hour and a half.

The military hand corn-mills, with a mechanical kneading trough, and this baking oven, was intended to form a complete portable and travelling military bakehouse, which was especially designed for van-guards, and detached bodies of the army. The apparatus was deposited in the War-Office at Paris, and a considerable number of them was about to be prepared for the Russian Campaign, when thebattle of Leipsic, and the subsequent defeats which the French Army sustained, turned the tide of conquest, and ultimately brought the allied armies to Paris, from whence the travelling baking oven was taken by the Prussians to Berlin, and there it is now deposited with other military stores and trophies of the war.

To the Editor of the London Journal of Arts, &c.

Sir—In my paper of last month, I described the way the ancient Egyptians divided their year. I now hand you the division of the Athenian year, with an explanation.

of the Greek names of the months, and a table shewing their correspondence with the Roman months, which may perhaps amuse some of your readers. In my next I shall transmit you an account of the Roman year.

I am, Sir,
Your obedient Servant,
BEN. COOK.

Birmingham, May 18th, 1827.

I would remark, that the Greeks did not begin to cultivate astronomy till a long time after the Egyptians, and their early history is so full of fables, that it is difficult to come at a correct account of their knowledge in this science, all we learn is, that they had made observations on the celestial bodies, and divided the heavens into constellations, thirteen or fourteen centuries before the birth of Christ. But notwithstanding their reveries, they began to improve in their knowledge of the principles of the science when *Thâles* and other Greeks had travelled into Egypt, and brought back with them the chief principles of the science. *Thâles* died at the age of 96 years, 548 years before Christ, and was the founder of the Ionian Sect, and the first who taught the Greeks the globular figure of the earth, the obliquity of the ecliptic, and the causes of the solar and lunar eclipses, which it is said he was able to predict. Anaxagoras followed, who invented the sun dial Geographical charts, and maintained that the sun was a mass of fire as large as the earth. Like Galileo, he was persecuted; both himself and family were proscribed by the Athenians, for attempting to subject the works of the gods to immutable laws, and his life would have paid the sacrifice of his temerity, had not Pericles got his sentence of death changed into exile. Next after the Ionian school was that of Pythagoras, who lived 586 years before Christ, he first taught the true system of the world, which many centuries afterwards was revived by Copernicus. In his school it was taught that the planets were inhabited bodies like our earth, and that the stars which are disseminated through infinite space, are suns, and the centers of other planetary systems. They considered comets as permanent bodies moving round the sun, and not as perishable meteors. From this time to the foundation of the school of Alexandria, nothing particular appears, except the celebrated cycle of nineteen years by Meton, (whom I shall speak more of, and his division of time, when I describe the Athenian year,) to conciliate the solar and lunar motions. This cycle was found so simple and useful, that when Meton proposed it to the Greeks assembled at the Olympic Games, as the basis of their calender, it was received with the greatest approbation, and unanimously adopted. The lunar cycle of Meton, was a period of 6940 days, in which are very nearly completed nineteen tropical revolutions of the sun, or solar years, and 235 lunations or revolutions of the moon with regard to the sun. After the completion of this cycle, the conjunctions of the sun and moon take place in the same degrees of the ecliptic, and consequently the new moons fall on the same days of the year as they did nineteen years before. For this discovery, Meton was declared victor at the Olympic Games, in the first department, and a statue erected to him; The scheme of their festivals was arranged according to the new cycle, which was inscribed on a marble pillar, in letters of gold; and hence the number which expresses the order of the current year in this cycle, is usually called the golden number.

I shall now proceed particularly to describe the ancient Athenian year, which commenced at the time of the winter solstice, and was divided into 360 days, but in order that it should correspond with the course of the sun, they invented several intercalations. In the *Diétéride*, or little cycle, they intercalated a month every two years. After this period, there was another, when the intercalation had place only every four years, but these two cycles were very defective, the first made the solar year too short, and the second too long, they had then recourse to a period of eight lunar years, named *Octaëtéride*, composed of seven common years of 364 days each, (see the table which shews its correspondence with the Julian year,) and of a year that had 90 days or three months, making this year, with the addition of 90 days, fifteen months long. According to some authors, these three months were intercalated, the second, the fourth, and the sixth year, and there was no intercalation the eighth year. They called these years *Embolimiques*. This cycle was very far from being correct, for it had two days too many, that is, it was too long by two days. Nevertheless they persevered in it, till Meton of Athens, in the 433 before Christ, invented and published his *Ennéadécaétéride*, or cycle *Lunisolaire*, of nineteen years, or as before stated, of 6940 days. But this cycle or period, has been supposed was known by other people of the north of Europe, before its publication by Meton. These nineteen years that composed this cycle, corresponded pretty nearly to so many solar years, by the means of seven months, one month being intercalated in the second, fifth, eighth, eleventh, thirteenth, sixteenth, and nineteenth year.

They fixed then the commencement of the civil year at the summer solstice, and it agreed with the Olympic year, or the year of the celebration of the games, that happened every four years. About one hundred years after Meton, the astronomer Callippus, perceived that this cycle of nineteen years, anticipated the solar year by several hours, he therefore proposed one of 27759 days or of 76 years, which began to be in use 330 years before Christ, and which contained about six hours more than the revolution of the moon in an equal number of days, and of fourteen hours, eighteen minutes more, than so many solar years. Beside the solar year, the Athenians, had a lunar year of 354 days, which they made use of for regulating the office of the magistrates; (see the table). and to which they added every 3 years, 1 month, *the 2nd. Posidèon.* The months were divided in 3 parts, which they called, the commencement of the month, the middle of the month, and the end of the month, each part consisting of ten days. The days were counted from one to ten, except in the ten days ending the month, when they began with the highest number ten, and ended by one, that is, they counted or rather called the days the 10th, 9th, 8th, &c. to one, ending the month, was practised by the Romans, see the example I have given in the division of the month. The last day of the month, they called the old, and the young moon, because that the morning belonged to the expiring moon, and the night to the new moon. This may also be explained by the old and new day. This word day being feminine in Greek, the commencement of the Athenian months, and their correspondence with ours, having varied, I can not mark them positively, because what was correct for one year, would not be so for another. In the 1st year of the 81st Olympiad, the 1st day of the month *Hècatombaeon*, fell on the 2nd of August, in the 1st year of the 92nd Olympiad, the 1st day of the month *Hècatombaeon*, corresponded with the 6th of July.

I will first endeavour to mark the correspondence of the Athenian year, with the months of the Julian year, taking the Athenian year 410 to the year 409 before

Christ, and giving as an example the common Athenian year of 354 days, without the intercalated month, it being the 3rd year of the 92nd Olympiad, beginning, or comprehending a period of time from the 14th July, 410 years before Christ, unto the 2nd July, 409 years before Christ, and being also the 22nd year of the Peloponesian War.

The common Athenian Year, without the intercalary Month.

ATHENIAN MONTHS, CORRESPONDING WITH THE JULIAN YEAR.

The Year 410 before Christ.

Day of Month.	The Month.	Days Contained		
1	Hécatombaeon	—29—	corresponding with...	July 14th
—	Métageitnion	—30—	do.	August 12th
—	Boédromion	—29—	do.	Sep. 11th
—	Pyanepsion	—30—	do.	Oct. 10th
—	Maemactérion	—29—	do.	Nov. 9th
—	Posidéon	—30—	do.	Dec. 8th

The Year 409 before Christ.

Day of Month.	The Month.	Days Contained		
—	Gamelion	—30—	do.	Jan. 7th
—	Anthestérion	—29—	do.	Feb. 6th
—	Elaphébolion	—30—	do.	March 6th
—	Munychion	—29—	do.	April 5th
—	Thargélion	—30—	do.	May 4th
—	Scirrophorian	—29—	do.	June 3rd

Explanation of the Seasons to which the months belonged, and the mode the Athenians adopted in counting their days. They did not, as we do, designate their days as the first, tenth, fifteenth, or twenty-fifth day of such a month, but according to the following example:—

Names of Months.	*Explanation of the Names of the Months.*
SUMMER MONTHS.	
1 Hécatombaeon	—Hecatombs—Offerings to the gods for the Renovation of the Year.
2 Métageitnion	—Métageitnies—Rural Fêtes when neighbours and friends united in society.
3 Boédromion	—Month of Succour—Because of the Victory of Theseus over the Amazons.
AUTUMN MONTHS.	
4 Pyanepsion	—Month of Figs—On the 7th of this month, Figs were eaten in the Fêtes named Pyanepsies.
5 Maimactérion	—The *Propitious*—A surname of Jupiter, to whom this month was consecrated.
6 Posidéon	—Neptune was named *Poseidon* by the Greeks.
2nd Posidéon	—This month was the intercalary month every three years.
THE WINTER MONTHS.	
7 Gamélian	—The month of Weddings, consecrated to Juno. *Gamelia.*
8 Anthestèrion	—The month of Flowers, the place of this month and the month Pyanepsion, has been much disputed.
9 Elaphèbolion	—The month of Diana, or the goddess of Hunting, whose Golden Arrows wound the Stag.
THE SPRING MONTHS.	
10 Munychion	—The month of Diana *Munychie*.
11 Thargelion	—This month has its name either on account of the first productions of the Earth as offerings to Apollo and Diana; or in the Pots or Vases called Thargéles, or from two words which indicate that the sun begins to warm and fertilize the Earth.
12 Skirrophorion	—The month when was carried in Ceremony, a Canopy or Parasol *Skirron*.

Mode of Counting the Days.		
1	Néoménie, or New Moon	
2	Second Day.	
3	3rd	Days of the commencement of the month.
4	4th	
5	5th	
6	6th	
7	7th	
8	8th	
9	9th	
10	10th	
11	first day.	
12	2d	Days of the middle of the month.
13	3rd	
14	4th	
15	5th	
16	6th	
17	7th	
18	8th	
19	9th	
20	20th or Eicade.	
21	10th	Days of the ending of the month.
22	9th	
23	8th	
24	7th	
25	6th	
26	5th	
27	4th	
28	3rd	
29	2d	
30	The Old and New Moon	

Sometimes nevertheless, from the 21st, they began to count 1, 2, 3, &c. &c. and the last day, they named also TRIACADE the thirtieth.

Novel Inventions.

Purifying Coal Gas.

THE new mode of purifying coal gas, for illumination, mentioned in our last as the invention of Mr. Ledsam, appearing to possess considerable claims upon public attention, we have endeavoured to obtain some further information relative to the process, and in the absence of the specification, which is not yet inrolled, we beg to lay before our readers a few remarks connected with the subject, and a brief statement of the general features of the process, as well as we have been able to collect them.

Nearly thirty years have elapsed since the practical introduction of gas-lights, and it must be admitted that many ingenious and most important improvements have been suggested and adopted in its production, from time to time, in proportion as it has been brought into more extensive use; but whilst the astonishing discoveries in chemistry, during the same period, have been successfully applied to so many operations connected with manufactures and the arts, it is a very singular fact that the purification of coal gas, which is obviously a chemical process, is at present conducted nearly as it was fifteen years ago.

In the infancy of its application to useful purposes, the simple passage of the gas through water was considered a sufficient purification. In 1810, Mr. B. Cook, of Birmingham, recommended the use of lime-water; and although many patents have since been granted for newer methods, several of the largest gas companies have actually returned either to this old plan, or to some modification of it. Indeed lime, in different states of humidity or in solution, is universally employed. It is found, however, generally to be inconvenient for the purpose, as well on account of the large quantities required, as of the expence and labour attending its application, and not less on account of the nuisance and bulk of the refuse lime. In the largest works ten tons per day are thus consumed, and the aid of a steam-engine is even necessary to agitate the solution.

As the efficacy of lime as a purifier depends chiefly on its alkaline properties, attempts have been made to introduce as substitutes for it, potash and soda; both of which are decidedly superior to lime, but the expence attending their use has hitherto prevented their adoption. This objection however, cannot be urged against the volatile alkali, ammonia, which may be readily procured in all gas works in ample quantity from the liquor deposited in the hydraulic main; and, when properly prepared, which may be done at a trifling expence, it becomes not only a better purifier, but it is also very considerably cheaper than lime.

The following is a brief sketch of Mr. Ledsam's process:—In the first place, a quantity of the ammoniacal liquor is saturated with muriatic acid. It is then reduced by evaporation, until it will crystallize on cooling. A portion of the crude muriate of ammonia thus obtained, is mixed with about two-thirds its weight of quick-lime, and put into a retort, over a moderate fire. From this retort a copious stream of ammoniacal gas is given out, and is brought into contact and mixture with the coal gas; which is chemically acted upon and deprived of its impurities; after which it is passed through a vessel of water wherein the ammonia is retained, and whence *it may be* *re-produced for future use.* The muriate of lime, remaining in the retort after each operation, will serve instead of muriatic acid, to convert fresh quantities of ammoniacal liquor, to the state of muriate of ammonia.

The apparatus is simple and not expensive, and the principle may be immediately applied where the wet-lime system is in use. The materials is two-thirds less expensive, and not one hundredth part of the bulk of lime. The attendance on the largest work will not employ more than one man. The quantity of gas is greater than usual. The operation may be conducted in the open air, and the cost of purifying may be estimated at about three halfpence per thousand feet, exclusive of the patent right.

Improved Ink Stand.

MR. DOUGHTY the inventor of the perpetual pens, made with ruby or rhodium nibs set in gold, has just introduced a new contrived ink bottle lined with caoutchouc.

The advantage of the invention is said to be the formation of an inkstand or bottle, from a material that can neither injure nor be injured by the ink; a moveable metallic stopper coated with gold or platina prevents any possibility of leakage, and it is less liable than any other inkstand to be broken or deranged, therefore it is the most perfect inkstand for writing cases and desks as well as for the pocket, and travelling that has been made.

From the various kinds of mountings in metal bronze, metal gilt, silver and gold, it will form an ornamental inkstand for the table, office, counting house, &c. and to those who use DOUGHTY's ruby or rhodium pens, or any of the metallic pointed pens which are commonly sold, it will be *especially valuable*, as no injury can be sustained by the points from being struck on the caoutchouc lining.

Mode of Digging a Canal During Frost.

THE Polish General Sokolnicki, has given to the public an account of the manner he pursued in making a canal in the middle of winter, when the earth was frozen very deep, for the purpose of draining some ground in Poland.

The canal was traced out in the autumn with a strong plough; the borders were dug out three or four feet deep, and the space filled up with dung and a considerable quantity of straw; the surface was also divided by the plough into squares of three feet, for the purpose of determining the size of the blocks of earth which he intended should be removed; and lastly, he prepared, at certain distances, inclined planes, that the sledges might go down to the bottom of the intended canal, which was to be four or five feet deep.

When the winter was set in, the ground sufficiently frozen and covered with snow, the excavation of the canal was begun. The workmen were directed to dig, with long pick-axes, trenches running horizontally under the frozen ground, and to introduce a sledge; wedges were then driven into the furrows, that had been made by the plough, when the ground was divided into squares; and the block being thus separated settled upon the sledge, and was drawn away immediately, by teams of horses, and placed on the neighbouring fields to serve as manure.

In this manner he completed in three weeks, at the expense of about £280, a canal, for the execution of which, by contract, he had been asked upwards of £4,000 sterling.—*Franklin Journal.*

Shot Cartridge, invented by MR. JOSHUA JENOUR, *Jun. of William Street, Hampstead Road.*

THE following communication has been received from the inventor, and the punch for making the cartridge cases, as well as specimens of the cartridges themselves, have been placed in the Society of Arts' repository.

To the Secretary of the Society of Arts.

SIR—Give me leave to offer to the notice of the Society of Arts an invention of mine, for the purpose of shooting at much greater distances than can be accomplished in the present way of charging guns, consisting in a sort of shot-cartridge, constructed upon a new principle, totally different from any thing of the kind hitherto used, and equally, I presume, applicable to military as to sporting purposes. Mr. Joseph Egg, gun-maker, of Piccadilly, has witnessed shots made at seventy, eighty, and a hundred yards distance, equal in strength and closeness to shots generally made at forty yards with a fowling piece. I shall be happy to make experiments before any members of the Society, and to communicate the invention, with specimens, &c.

I am SIR, &c. &c.

JOSHUA JENOUR, Jun.

"The unwinding of a cord or twine, a chain or wire, from a spiral groove infolding the charge of shot, constitutes the chief principle, by means of which they are thrown from the gun in a mass, and dispersed at various distances. Two or more pieces of metal are so constructed, as when bound together by the twine, &c., to form a cylindrical case, inclosing the charge of shot, corresponding to the size of the gun, and having a regular spiral groove from end to end, similar to a common screw. One end of the twine is made fast, and the other is left free, to be unwound by the resistance of the air, acting upon it during the passage of the cartridge. The unwinding of the twine being completed, the centrifugal force occasioned thereby opens the case and liberates the contents. One of the subordinate points of construction is that of filling the interstices of the charge with fine sand, or other matter, either mixed or not with tallow, in order to prevent the fired powder from penetrating into and deranging the construction of the cartridge; and also for the purpose of preserving the spherical form of the shot, whereby the penetrating force is increased.

The experiments which I have individually made, in a very imperfect manner, under every disadvantage, may be considered as merely amounting to a discovery of the important principle here described. Various trials upon an extensive scale are evidently required, in order to fix the minute particulars of construction for cartridges, to break uniformly at various given distances; as the quality and substance of the metal, the size of the grooves and the number of turns, the quality and size of the binding-cord, the exact adjustment of its loose end, so that it be uniformly acted upon by the air in its passage from the gun the general and nice uniformity of sizes, weights, &c., of cartridges for each particular distance, with other minute practical points requisite to attain a general uniformity of construction, and a consequent certainty of effect.

"Numerous, accurate, and systematic experiments would, I have no doubt, ultimately lead to the production of cartridges highly complete, to shoot close and strong with a fowling piece at any required distance, to the extent of several hundred yards.

"The following data are collected from the experiments which I have made. The distance to which the shot are conveyed in a body, is to be regulated by the number of turns or length of the binding; also by the specific gravity, the texture and the size of it, and by the charge of powder.

"The shorter the binding, the less will be the distance to which the shots are conveyed in a body, and *vice versa*. The case should be of the least possible weight, to possess sufficient strength to resist any compression by the action of the discharge, and should retain the whole of its contents, until the last turn of the binding is unwound."

Plate IX, fig. 3, the mould fixed in the block *a*; *b*, the hollow which gives shape to half a cartridge; *c*, the hammer or punch, the nose of which is covered with lead *d d*, cast in the mould, and on it at the same time: *e*, *e*, the joint. Fig. 4, an inside view of a half cartridge, made of copper sheet, it serves also to represent the hollow of the mould, which is worked like a screw, so that when two of these shells are tied together with string or copper wire, through two holes at *f*, fig. 5, they form one continuous spiral, along which the string *g*, is wound; *h*, a hole, through which one end of the string is secured by a knot on the inside: the end of this string *g*, is left loose as a tail, by which the cartridge is caused to revolve in its flight until the string is quite unwound; it then opens and lets out the shot like fig. 6.

On the 12th December last, some experiments were tried at Bayswater, by direction of the committee.

The gun employed on this occasion was a duck-gun belonging to Mr. Beckwith; it was fired from a rest, and the mark was at the distance of one hundred yards. The mark consisted of five open sheets of common brown paper, three being placed in one line, and the other two forming a second line immediately below, and touching the upper one.

Experiment 1st. Powder, 2½ drachms; shot, 2½ ounces, of No. 6; weight of charge, including the cartridge case, 3 ounces: 102 shots put in, some in every sheet.

2d. Powder, 3 drachms; shot as before; 199 shots put into the middle and right hand sheet of the upper row.

3d. Charge as before, except that the shot was No. 2, and the cartridge, which in the former trials had been bound with thin twine, was in this bound with whip-cord, 14 shots put into the middle sheet of the upper row.

4th. Charge as before: 19 shots put into the right hand sheet of the upper row.

The following experiments were made with slugs:—

5th. Powder, 3 drachms; slugs 33, weighing 2½ ounces: 14 were put into a target four feet square.

6th. Charge as before: 10 slugs put in.

7th, 8th, 9th, and 10th. Charge as before, but omitting the cartridge: 2, 3, 5, and 12 shots were respectively put into the target.

In the above experiments most of the slugs, and even some of the shot, pierced through twenty-five folds of brown paper.

The Society are of opinion, that Mr. Jenour's cartridge possesses the merits of novelty, ingenuity, and probable utility, especially for wild fowl shooting. They are aware that many experiments remain to be tried, in order to ascertain the precision of which the invention is capable, and will be glad to receive farther information on this subject.

New method of Lighting large Apartments.

M. Locatelli, a mechanician of Venice, distinguished by many important discoveries, has invented a new process for lighting public halls. It is well known that Rumford and others, endeavoured in vain to discover the means of dispensing with chandeliers, so inconvenient in theatres and other halls of audience. The new process employed at Venice has completely succeeded, and leaves nothing to be desired. Instead of parabolic mirrors, the light of several lanterns is concentrated on an opening in the middle of the hall, (probably the ceiling,) and falls upon a system of lenses, plano-concave, which fill the opening, (a foot in diameter,) and distribute through the apartment rays, which, falling parallel on the lenses, issue divergingly. From the centre, or pit, nothing is perceived but the lenses, which resemble a chaffing dish of burning coals, illuminating the whole house, without dazzling or fatiguing the eye. Besides the advantage of being more equal and soft, the light is more intense than that of the chandelier ; there is not a spot in the hall where one cannot see to read with the greatest facility.—*Rev. Encyc.*

Paper from Bark.

The Brothers of Cappueino, paper-makers at Turin, have found the means of supplying the want of rags, by the fabrication of a new kind of paper from the thin bark of the poplar, willow, and other kinds of wood. The academy of sciences having examined the specimens thus produced of writing, printing, and wrapping paper, acknowledge the goodness of them, and praise the invention so that his majesty has granted to the brothers, an exclusive privilege for ten years, for the manufacture of paper, from ligneous materials.—*Journal de Turin.*

Polytechnic and Scientific Intelligence.

ROYAL SOCIETY.

(Continued from Page 172)

After the conclusion of the business of the Society on St. Andrew's day, reported in our last, the members adjourned to the Crown and Anchor tavern, to celebrate their anniversary, by partaking of a sumptuous dinner.

The next meeting of the Society, took place on :—

Dec. 7. When a paper was read on the composition of James's Powder of Pulvis Antimonialis; by J. Davy, F.M. D. F.R.S.

Dec. 14. On the relative powers of various metallic substances, regarded as conducters of electricity; by W. S. Harris, Esq.; communicated by John Knowles, Esq. F.R.S.

Dec. 21. On an improved differential thermometer; by A. Ritchie, M.A. Rector of the academy of Tain; communicated by Sir H. Davy, P.R.S.

The Society then adjourned till after Christmas, to meet again on Thursday, Jan 11, 1827. But in consequence of the lamented death of H.R.H. the Duke of York, the business of the Royal Society was not resumed until the 25th of January, when a paper was communicated by Davies Gilbert, Esq. "on the expediency of assigning specific names to all such functions of simple elements, as represent definite Physical properties, with the proposition of a new term in mechanics; illustrated by an investigation of the machine moved by recoil, and also by some observations on the Steam Engine. At this meeting the name of Professor Jamieson was ordered to be inserted in the printed lists of the Society.

Thursday, Feb. 1. A paper was communicated by D. Moore, Esq. F.R.S. which gave an account of a new genus of Serpenti-form Sea Animal, by J. Harwood, Esq. M.D. F.L.S. Prof. Nat. Hist. R.I.

This singular animal was taken up at sea, by Captain Sawyer, in Lat. 62° N. and Long. 57° W. It was in an exhausted state, apparently from having gorged a large fish. Dr. Harwood observes, that the animal in several characters resembles the ophidian reptiles, especially in the structure of the jaws, which are truly serpenti-form, with the exception of the interarticular bones; from this resemblance, and from the large sac with which it is provided, Dr. Harwood gives it the generic name of Ophiognathus. The author then describes the animal, giving it the specific name of Ampullaceus, illustrating it by three drawings.

G. Poulett Scrope, Esq. was admitted a Fellow of the Society.

Friday, Feb. 8. A. Melville, Esq. and T. J. Pettigrew, Esq. were admitted Fellows of the Society, and a paper was communicated by Sir Everard Home, entitled, "An examination into the structure of the cells of the Human lungs, with a view to ascertain the office they perform in respiration; illustrated by microscopical observations;" by J. Bauer, Esq. F.R.S.

It appeared the author's main object in this paper, was the disproval of the usually accepted chemical theories on respiration, and to shew that air, or at least oxygen, is actually absorbed in that function. His view of the subject, he principally founded on the anatomical structure of the air cells, respecting which some new facts are brought forward.

Feb. 15. Sir R. R. Vyvian, Bart. M.P. and Cæsar Moreau, Esq. were admitted Fellows of the Society, and the following papers were read:—

South Polar distances of stars, included within the tropic of Capricorn; observed in the month of May and June, 1822, reduced to their mean places for January, 1823; with other astronomical observations; by C. Runker, Esq.

1. A catalogue of the South Polar distances, of about 204 stars in the Southern Hemisphere, arranged in a table accompanied by columns, containing their annual variations in S.P.D. and their elements of aberration and nutation.

2. A determination of the latitude of the observatory at Paramatta, as deduced from circumpolar altitudes β Argus, observed with the repeating circle, the determination differing 15'' from that obtained from solstices and zodiacal stars.

3. Observations of the summer solstice of 1822, with the mural circle. 4. Observations of the moon. 5. Observations of the comet of 1824, in the Lion, with its elements, as also of another comet discovered by Sir Thos. Brisbane in the Lion, in the year 1825; and of another, designated as the great comet of 1825. 6. Observations of the oppositions of Mars. 7. Intervals between the transit of the moon, and those of the fixed stars, culminating nearly in the same parallel in the year 1826. 8. Observations of an eclipse of the moon at Paramatta, May 21, 1826.

The author regards the accuracy of these observations as inferior to those obtained by Jupiter's satellites,

9. Observations of the Northern solstice of the sun, with a repeating circle of Reichenbach, at Paramatta, in the year 1826. The obliquity resulting from these observations differing only 4" from that stated in the Nautical Almanac. Remarks on a correction of the solar tables, required by Mr. South's observations, by G. B. Airey, Esq. F.R.S. and Lucasian Professor of Mathematics, in the University of Cambridge.

The reading was begun of a paper on the mutual attraction of the particles of magnetic bodies, and on the law of variation of the magnetic forces generated by rotation; by S. H. Christie, Esq. M.A. F.R.S.

Feb. 22. G. W. Taylor, Esq. M.P., was admitted a Fellow of the Society; and the reading of Mr. Christie's paper was concluded.

The results described by Mr. Christie in a former paper when a copper disc was made to revolve under a magnetized needle, appearing to him not likely to lead to an accurate knowledge of the law of magnetic attraction developed during rotation, from the effect of lateral attraction, he was induced to resume the inquiry, substituting a ring for the disc, expecting that as no lateral force would here be called into action, the results would be more uniform; and in this expectation he was not disappointed. One of the first phænomena that he encountered, was a very great diminution of magnetic force, when a ring of the same weight was substituted for a disc; and pursuing this point of inquiry, he found, that in all cases of solution of continuity, not only by cuts in the direction of radii from the centre, but also in concentric annuli or otherwise, there is always a great loss of force; the magnetism of the whole being always much greater than the sums of that of the parts.

In reasoning on the experiments detailed, Mr. Christie concludes that the greater development of magnetism in a disc subjected to the action of revolving magnets, takes place, when the axis of the magnets are vertically under points bisecting the radii, and that the magnetism decreases very rapidly as they approach the edge; thus indicating that for a full development of magnetism, a continuity of substance in all directions from the point acted on is principally requisite. Various phænomena lead also to the conclusion that the reduction of the disc by concentric and radiating cuts into very small portions, would render its magnetism quite insensible.

The author next proceeds to investigate by experiments of the same kind, the law of variation of the magnetic force, regarded as depending on the distance of the revolving magnets from the suspended body. Assuming in this investigation, as a consequence of the principles proposed by other writers, that the action may be referred to a single point or pole in the copper ring, somewhat in arrear of the point vertically over the magnet, and also that the mutual action of this pole, and the single point near the extremity of each magnet, to which its action may also be referred, is inversely as the 4th power of their distance, he found these laws to be established by the experiments, made in various ways.

Lastly, Mr. Christie enters into an analytical examination, the object of which is to ascertain how far the principle of time being required for the development of magnetism, will account for the phænomena; and the conclusion at which he arrives, is, that it will do so satisfactorily. In the course of this examination, he infers that in certain cases a retrograde rotation in the suspended disc might take place, and suggests the great confirmation which such a fact, if observed, would afford this theory.

A notice was read entitled, " Correction of an error in a paper published in the Philosophical Transactions, entitled

'On the parallax of the fixed stars;' by J. F. W. Herschel, Esq., M.A. Sec. R.S.;" and a paper was also read, entitled ".On attractions apparently magnetic exhibited during chemical combination; by W. L. Henwood, Esq." communicated by Davies Gilbert, Esq. M.P. V.P.R.S.

March 1.—Dr. J. C. Prichard was admitted a Fellow of the Society; and a paper was read, entitled, "On the structure and use of the submaxillary odoriferous gland of the Crocodile; by Thomas Bell, Esq. F.L.S.:" communicated by Sir E. Home, Bart., V.P.R.S.

Beneath the lower jaw of the Alligator and Crocodile, on each side, is situated a gland which secretes an unctuous substance of a strong musky odour. About two years since, the author of this paper discovered in it a structure, which is without parallel in the glandular system of other animals. His observations were made on the common American Alligator. In this animal the external orifice of the gland is situated about two-thirds of the length of the lower jaw backwards from the symphysis, being a longitudinal slit a little within the lower edge of the basis of the jaw, through which exudes the substance just mentioned. During warm weather, when the animal feeds freely, the secretion is copious; but in winter it is much diminished in quality, and is less powerful in scent. The gland itself is a simple follicle of an elongated pyriform figure, lying between the skin and the under surface of the tongue. In an Alligator of four feet in length, it is about half an inch long, and one sixth of an inch in diameter. This gland is enveloped by extremely fine and delicate muscular fibres, disposed obliquely, consisting of two fascicule passing repeatedly over and under the gland, which unite at its base into a long and slender round muscle, closely attached to the corner of the os hyoides, and following the course of another muscle, apparently identical with the mylo-hyoideus in the mammiferous animals. The use of the muscle appears to be to bring the gland into a proper position for its discharge, and then to operate the discharge, by pressure.

The author, considering the situation of the gland near the mouth of the Alligator, and the predatory habits of the animal, together with its voracity of fish, and the well-known partiality of fish for odoriferous oils and extracts, conceives, that this secretion acts as a bait, attracting the fish to such a position as will enable the Alligator readily to seize them, in his usual way of seizing his prey, by snapping sideways at them.

The reading was also commenced, of a paper "Note on the chemical composition of two liquids lately proposed as powerful disinfectants, and on the action of those liquids on putrid animal matter;" by A. B. Granville, M.D. F.R.S.

[*To be continued.*]

Blinds for Circular-Headed Windows, invented by Mrs. Henry Goode, *of Ryde, in the Isle of Wight.*

Semi-circular windows and rectangular windows with semi-circular heads, are common in modern churches and chapels, and in most rooms for public meetings as well as occurring occasionally in private houses. In the square parts of such windows, blinds of various well known constructions are inserted, in order to exclude, when necessary, the rays of the sun; but the heads are either left without blinds, or are fitted with awkward and imperfect contrivances to effect the desired object.

Plate IX, fig. 2, is an elevation of the arch of a window;

a, a, a metal tube, bent so as to fit the head of the window, and serving as a circular curtain rod; this tube is open all along the upper edge. The ends fit into holes at *b*, and *c*, made through the window-bar *d*: at *b*, a pulley is fixed, corresponding with the bore of the bent tube *a*, an endless band *e, e, e*, enters the tube *a*, by the end *c*, goes out at the other end, passes under the pulley at *b*, then crosses the window below the bar *d*, passes over the pulley at *c*, and the spring catch pulley *f*.

In order to make the blind, a piece of cloth is employed a little wider than the height of the arch, and rather longer than its circumference, which is folded like a fan, a nail is then passed at the bottom, through all the folds, into the middle of the window bar at *d*, forming a centre to the semi-circular tube *a, a*; holes are made at the other end in the folds, which allows the blind to slide along the tube, as shewn in the figure. The bottom fold is tacked to the window bar near the end *b*, and two pieces of tape connect the upper fold with the endless band, by passing through the split tube.

The blind is drawn over the window, or withdrawn from it, according as one side or the other of the endless band is pulled, as in the common roller blind.

[The Society of Arts presented Mrs. Goode their Silver Vulcan Medal for this invention.]

New Phenomena observed in Steam.

M. Clement has communicated to the Royal Academy of Science in Paris, some singular results observed by him, connected with steam. When steam is greatly compressed in a boiler, so that a strong current is made to blow out through a small orifice, a metal plate, or disc being presented at a little distance from the orifice is forcibly repulsed; but if it is brought near and pressed, so as nearly to close the orifice, and cause the steam to escape in a star form round the outside of the disc in radiant direction, an external pressure will be found to act upon the disc and it can only be set at liberty by forcibly raising it.

If the aperture of the steam vessel be directed towards the earth, the disc, notwithstanding the downward pressure of the steam is added to its own gravity, will not fall, but remain suspended; and force must be employed to make it quit its position. The same result takes place, if the experiment be made with the strong wind of the bellows of a smith's forge.

In the first experiment M. Clement ascertained that valves of ordinary strength, which are true discs, placed upon the orifices of boilers, present danger inherent in their form. When they are only lifted just enough to let a thin sheet of vapour escape from the aperture, it becomes impossible to raise them any more by the force of the steam; and if the production of steam be too rapid to be discharged by this small opening, or the strength of the copper unequal to resist its force, an explosion will take place, though the valves are partially open. This though it has been thought incredible is what has really happened.

M. Clement says that time does not permit him to explain the discovery he has made of these singular phenomena, it is only known that he attributes them to a vacuum, which is formed in the stream at very high pressure, in consequence of the great swiftness of its molecules; and by the conical form of the tube, through which the vapour is passed, causing it to dilate itself towards the edge much below the atmospheric pressure;

the force of the atmosphere is thus enabled to act with sufficient strength on the moveable disc to enable it to resist the vapour.

Security against danger in this experiment, depends on taking care that there should be a sufficient distance between the openings and the edges of the disc. It is necessary that the first should be large, and the other small, otherwise the employment of a conical tube to the valve, would diminish the effect of the atmospheric pressure.

M. Clement is of opinion that some length of experience will be necessary to become acquainted with the best mode of making secure valves, capable of preventing the danger to which he has alluded; and he strongly recommends that experiments should be made keeping in mind the hints which he has given.

Successful Treatment of Hydrophobia.

On the, 28th of October last, a young apothecary was bitten in the left hand by a cat, which died two days after with confirmed madness. He satisfied himself with washing the wound, and pressing out the blood. Twenty-four hours after, he cauterized the part superficially. Recommended by his physician to M. Rossi of Turin, the latter discovered in the wound marks of the peculiar virus and prescribed a drink of pure vinegar every morning, and two glasses of a decoction of juniper, (genista lateo-tinctora,) during the day. It was deemed necessary particularly to examine the small glands under the tongue.

In the early part of December, unfavourable systems began to appear. The patient lost his vivacity, became taciturn, seeking retired places, and weeping abundantly. His sleep was short and restless, his complexion livid, and his eye fiery. His physician then perceived that the left gland was swollen and inflamed. He immediately ordered a deep cauterization upon the two glands, by means of a red hot iron. This painful but necessary operation was followed by a violent access of fever, which gradually declined, and finally disappeared on the third day. From that time the patient has been perfectly restored, and has not experienced the least sensation from his wound.—*Revue Encyc.*

Herpetology.

MR. SAMUEL F. BARKER, of Andover, United States, states that, being employed with others in making a stone bridge in the north parish of Andover, they discovered on taking up a large flat stone, (about three feet by five,) a great body of living snakes, which had probably taken shelter there for the winter. They were stiff at first from the cold, but exhibited various signs of life when exposed to the sun. On being counted there were found to be *one hundred and sixteen;* and what renders the circumstance more singular, there were various species, viz: black, striped, and green snakes, and house and brown adders, numbers of each. They were of different sizes, varying from six inches to two feet.—*Salem (Massachusetts) Gazette.*

Scotch Patents.

LIST OF PATENTS GRANTED IN SCOTLAND SINCE AUGUST 19, 1825.

For a New Polishing Apparatus for household purposes. To Joseph Alexander Taylor, London—Sept. 5

For an Improvement in the Loom for Weaving Tape. To Thomas Worthington junior, and John Mulliner, Manchester—Sept. 16

For an Improved Blowing-machine. To Charles Powell, Monmouthshire—Sept. 17

For Improvements in the construction of Rail-roads and carriages. To William Henry James, Birmingham—Sept. 21

For Improvements in the making of Buttons. To Benjamin Sanders, Worcester—Sept. 30

For Improvements in manufacturing Carpets. To Adam Eve, Lincolnshire—Oct. 1

For Improvement upon a Machine for working Fancy Net. To Hugh Martin and Thomas Lee, Renfrewshire—Oct 1

For an Engine for Cutting Nails, Sprigs, and Sparables. To James Wilks and John Ecroyd, Rochdale—Oct. 4

For an Improvement in the construction of Riding Saddles. To George Thompson, Wolverhampton—Oct. 10

For an Improvement in the construction of Wheels. To George Hunter, Edinburgh—Oct. 10

For a new method of manufacturing Pipes for the conveyance of Water. To Samuel Bagshaw, Newcastle-under-Lyne—Oct. 10

For a process of converting Iron into Steel. To Nathaniel Kimball, London—Oct. 13

For Improvements in the manufacture of Steel. To John Martineau the younger, Middlesex, and Henry William Smith, London—Oct. 13

For Improvements in the manufacture of Buttons. To Thomas Dwyer, Dublin—Oct. 13

For Improvements in Machinery for propelling Vessels. To John Reedhead, Devonshire—Oct. 16

For Improvements in the process of Refining Sugar. To Henry Constantine Jennings, Middlesex—Oct. 28

For Improvements in the construction of Diving Bells. To Thomas Steele, Cambridge—Nov. 5

For Improvements in the construction of Hats. To John Bowler, Surrey, and Thomas Galon, Middlesex—Nov. 5

For a Machine for Impelling Power without the aid of fire, water, air, steam, gas, or weight. To William Jefferies, Middlesex —Nov. 15

For a Cement for Building. To John Phillips Beavan, Middlesex—Nov. 17

For Improvements in Machinery for preparing, drawing, roving, and spinning Flax, Hemp, and Waste Silk. To Alexander Lamb, London, and William Suttill, Middlesex—Nov. 23

For certain Improvements in Chronometers. To John Gotlieb Ulrich, Middlesex—Dec. 14

For certain Improvements in generating Steam. To John McCurdy, Middlesex—Dec. 15

For a New Method of manufacturing or preparing an Oil or Oils, extracted from certain vegetable substances, and the application thereof to Gas Light and other purposes. To Edmund Luscombe—Jan. 4, 1826

For certain Improvements on Machines for scribbling and carding Sheep's Wool, Cotton, &c. To Ezekiel Edmonds of Bradford —Jan. 4

For a method of conducting to and winding upon Spools or Bobbins, rovings of Cotton, Flax, Wool, or other fibrous substances. To Joseph Chesseborough Dyer, of Manchester—Jan. 4

For the preparation of substances for making Candles, including a Wick constructed for that purpose. To Moses Poole—Jan. 18

For an Improved Power-Loom for the weaving of Silk, Cotton, Linen, &c. To John Harvey, Surrey—Jan. 18

For Methods of seasoning Timber. To John Stephen Langton, county of Lincoln—Jan. 18

For Improvements in the Manufacture of Hat Bodies, communicated by a foreigner residing abroad. To James Blyth Wayman—Jan. 30

For Improvements in the construction of Carriages and Harness. To Thomas Cook, Surrey—Feb. 1

For Improvements in Looms, and implements connected therewith. To T. W. Stansfeld, and W. Pritchard, Leeds—Feb. 1

For an apparatus for propelling Carriages on common roads, or on railways. To Goldsworthy Gurney, Middlesex—Feb. 1

For a new Method of bleaching the Pulp for making Paper. To James Brown, county of Edinburgh—Feb. 2

For an Improvement or Improvements in the process of refining Sugar. To Charles Freund, Middlesex—Feb. 10

For a Machine for effecting an alternating motion between bodies revolving about a common centre. To J. Lean, Bristol—Feb. 11

For certain apparatus for the concentrating and crystallization of aluminous and other saline and crystallizable solutions, &c. To Josias Christopher Gamble, county of Dublin—Feb. 11

For a new Preparation of fatty substances, and the application thereof to the purposes of affording light. To Nicholas Hegesippe Manicler, Surrey—Feb. 16

For a series of Machines, and certain Implements for Cabinet Maker's Work. To W. Thomson, and J. Thomson, Edinburgh—March 20.

For an Improvement in Cooking Apparatus. To William Erskine Cochrane, Middlesex—March 31.

For certain Improvements on a former Patent for an Engine for effecting a Vacuum. To Samuel Brown, Middlesex—May 6.

For an Improved Apparatus for Spinning, Doubling, and Twisting Silk. To Henry Richardson Fanshawe, London—May 6.

For certain Improvements in the Manufacture of Steel. To John Martineau, junior, Middlesex—May 6.

For an Improvement in the mode of propelling Vessels. To William Parr, Middlesex—May 9.

For a New Polishing Apparatus. To Joseph Alexander Taylor, London —May 9.

For an Improvement in Machinery, for Spinning and Twisting Silk and Wool, &c. To F. Molineux, Somersetshire—May 20.

For Improvements in Machinery for Preparing, Drawing, Roving, and Spinning Hemp, Flax, &c. To Alexander, Lamb, London, and William Suttill, Middlesex—May 20.

For an Improved mode of constructing Wheeled-Carriages, to be used on Rail-roads. To Thomas Shaw Brandreth, Liverpool —May 26.

For an Improved Steam-Engine. To Joseph Eve, London—May 26.

For a method of Applying Steam without Pressure to Pans, Boilers, Pipes, and Machinery, in order to produce and regulate various Temperatures of Heat. To Richard Mee Raikes, London—June 12.

For a new Manufacture of Ornamented Metal or Metals. To Thomas John Knowles, Oxford—June 17.

For certain Improvements on Machinery, to be operated upon by Steam. To Francis Halliday, Surrey—June 26.

For certain Machines and Improvements on Machines and Instruments, or Tools, applicable to the Performance of Cabinet Maker's Work. To W. Thomson, Edin. and Malcolm Muir, Glasgow—June 29.

For Improvements on Rotatory Steam Engines, &c. To Louis Joseph Marie, Marquis de Cambis, Middlesex—July 12.

For Improvements on Apparatus and Works for Inland Navigation. To Henry Anthony Koymans, London—July 21.

For Improvements in Machines for Carding, Slivering, Roving, or Spinning Wool, Cotton, &c. To Moses Poole, Middlesex —August 7.

For an Improved method of preparing Straw, and Grass for Hats and Bonnets. To J. Grey, and Jacob Harrison, Cumberland —Sept. 5.

For certain Improvements in Engines or Machinery, to be actuated by Steam. To Francis Halliday, Surrey —Sept. 9.

For an Apparatus for preventing the Inconvenience arising from Smoke in Chimneys. To the said Francis Halliday—Sept. 9.

For certain Improvements in Steam-Engine Boilers, or Steam Generators. To John Poole of Sheffield, in the County of York—Oct. 10.

For a New process in Painting, for producing the appearance of Damask. To David Ramsay Hay, Edinburgh—Nov. 2.

For an Improvement or Improvements on Wheels for Carriages. To Theodore Jones of Coleman Street, London—Nov. 8.

For certain Improvements in Apparatus for Cooling and Heating Fluids. To James Yandell, of Broad Wall, Surrey—Dec. 13.

For a New Apparatus on which to suspend Carriage Bodies. To Henry Charles Lacy, Manchester—Dec. 14.

For certain Improvements on Apparatus applicable to the Burning of Oil, and other Inflammable Substances. To Thomas Machell, County of Middlesex—Dec. 14.

For an Apparatus adapted to Cool Wort or Must, and for condensing the Steam. To Dominique Pierre Deurbroucq, Esq. County of Middlesex—Dec. 20.

For a New Engine for communicating Power to answer the purposes of a Steam-Engine. To Count Adolphe Eugene de Rosen, County of Middlesex—Dec. 29.

For certain Improvements in propelling Boats and Ships, and other Vessels or Floating Bodies. To William Busk, Esq. London—Dec. 29.

New Patents Sealed, 1827.

To James Whitaker, of Wardle, near Rochdale, manufacturer, for his invention of certain improvements in machines or machinery, for preparing and carding engines, and for drawing, slubbing, and spinning wool and cotton—Sealed 24th April—2 months.

To Carlo Ghigo, of Lyons in France, but now residing in Fenchurch Street, in the City of London, loom manufacturer, for his invention of certain improvements in weaving machinery—24th April—6 months.

To Morton William Lawrence, of Leman Street, Goodman's Fields, in the County of Middlesex, sugar refiner, for his invention of an improvement in the process of refining sugar—28th April—6 months.

To Joseph Anthony Berollas, of Great Waterloo Street, in the Parish of Lambeth, in the County of Surrey, watchmaker, for his invention of a detached alarum watch—28th April—2 months.

To Robert Daws, of Margaret Street, Cavendish Square, in the County of Middlesex, upholsterer, for his invention of certain improvements on chairs or machines calculated to increase ease and comfort—28th April—6 months.

To Thomas Breidenback, of Birmingham, in the County of Warwick, merchant, for his invention of improvements in certain parts of bedsteads—28th April—6 months.

To Benjamin Somers, of Langford, in the Parish of Bennington, in the County of Somerset, M. D. for his invention of certain improvements on furnaces, for smelting different kinds of metals, ores and slaggs—28th April—6 months.

To William Lockyer, of the City of Bath, brush maker, for his invention of an improvement in the manufacture of brushes of certain descriptions, and in the manufacture of a material or materials, and the application thereof to the manufacture of brushes and other purposes—28th April—6 months.

To Henry Knight, of Birmingham, clock-maker, for his invention of a machine apparatus, or method for ascertaining the attendance to duty of any watchman, workman, or other person, which machine apparatus or method is also applicable to other purposes—28th April—6 months.

To John M^{c}Curdy, of Cecil Street, Strand, in the County of Middlesex, Esq. in consequence of a communication made to him by a certain foreigner residing abroad, and discoveries made by himself for an invention of certain improvements in the process of rectification of spirits—28th April—6 months.

To John Browne, and William Duderidge Champion, of Bridgewater, in the County of Somerset, merchants and co-partners, for their having found out and discovered a certain composition or substance, which may be manufactured or moulded either into bricks or into blocks of any form for building, and also manufactured and moulded to, and made applicable for all internal and external ornamental architectural purposes, and for various other purposes—5th May—2 months.

To David Bentley, of Eccles, in the County of Lancaster, bleacher, for his invention of an improved carriage wheel—8th May—6 months.

To Thomas Patrick Coggin, of Wadworth, near Doncaster, in the County of York, machine maker, for his having found out or invented a new or improved machine for dibbling grain of every description—19th May—2 months.

METEOROLOGICAL JOURNAL, April and May, 1827.

1827.	Thermo.		Barometer.		Wind.	Weather.
	Max	Min.	Morn.	Even.		
Apr.						
28	69	45	29,92	29,85	S.	Fair—clear
29	73	52	29,84	29,85	S.—S. E.	Ditto—Ditto
30	76	56	29,88	29,85	S W.	Ditto—ditto
May						
1	70	56	29,85	29,87	N. W.—W	Ditto—cloudy
2	70	51	29,85	29,80	S.—S. E.	Ditto—ditto
3	71	54	29,78	29,73	W.—N. W.	Ditto—clear
4	63	50	29,72	29,61	W.	Ditto—cloudy—wind
5	65	53	29,50	29,33	S. W.	Slight rain
6	56	44	29,08	29,28	S.W.—S.—N.E.	Rain 1·25—wind
7	55	43	29,47	29,61	E.—N. E.	Fair
8	52	34	29,66	29,71	E.—N E.	Cloudy—cold wind
9	55	41	29,67	29,63	N. E.	Ditto
10	55	39	29,67	29,68	E.	Ditto—shower
11	56	39	29,80	29,82	N.	Fair
12	60	38	29,90	29,92	N.—E.	Ditto
13	56	43	29,70	29,72	E.	Ditto
14	58	42	29,60	29,64	NE.—N—N.W.	Cloudy—rain ,06
15	59	47	29,60	29,54	S. E. —S.	Ditto—fair
16	64	52	29,44	29,26	S. E.—S.	Ditto—wind—rain ,62 & lightening
17	65	50	29,40	29.47	S	Ditto—Ditto—Ditto ,12 thunder
18	69	54	29,47	29,62	S. W.	Fair—sun—clouds
19	72	54	29,73	29,83	S. W.—W.	Ditto—Ditto—Ditto
20	72	54	29,87	29,90	S. E.	Ditto—Ditto—Ditto
21	74	54	29,94	29,97	E.—S. W.	Fair—clear
22	65	54	29,92	29,86	S.—W. W.	Cloudy—shower
23	69	55	29,83	20,41	S. W.	Ditto—damp
24	63	48	29,30	29,21	W.—N. W.	Thunder—hail and rain ,25
25	61	47	29,20	29,23	W.—N.W.	Rain ,25
26	60	50	29,25	29,34	S. W.—N. W.	Ditto ,25

Hitchen, Herts. **WATSON PERKS.**

D.	H.	M.	S.	
1	0	0	0	♃ Stationary.
2	8	53	0	☽ in □ first quarter.
3	6	0	0	☿ in conj. with 2 η in Taurus
3	6	0	0	☽ in conj. with ν in Leo.
3	11	0	5	♃'s 2nd Satt. will emerge.
5	0	0	0	☉ before the Clock 2' 1"
5	8	0	0	☽ in conj. with α in Virgo.
6	20	0	0	☽ in conj. with 2 α in Libra.
7	16	0	0	☽ in conj. with η in Libra.
7	20	0	0	☽ in conj. with λ in Libra.
8	1	0	0	☽ in conj. with 1 β in Scorpio
8	1	0	0	☽ in conj. with 2 β in Scorpio
8	3	0	0	☽ in conj. with γ in Scorpio
9	3	50	0	Ecliptic Opposition or ◎ Full Moon.
9	5	0	0	☾ in conj. with ρ in Oph.
10	0	0	0	☉ before the Clock 1' 7".
10	1	0	0	☾ in conj. with 2 μ in Sagitt
12	1	0	0	☾ in conj. with β in Capri.
12	10	8	39	♃'s 1st Satt will emerge.
15	0	0	0	☉ before the Clock 6"
15	5	0	0	☿ in conj. with ♂ long. 0° in Cancer ☿ lat. 1° 38' N. ♂ lat. 50' N. diff. of lat. 48'
15	20	27	0	☾ in □ last quarter.
18	1	0	0	☿ in conj. with ε in Gemini.
20	0	0	0	Clock before the ☉ 58"
21	7	0	0	☾ in conj. with ♀ long. 1° in Gemini ☾ lat. 1° 29' S. ♀ lat. 1° 25' S. diff. of lat. 4'
21	17	0	0	☾ in conj. with ε in Taurus
21	18	22	0	☉ enters Cancer.
23	2	0	0	☾ in conj. with ζ in Taurus
23	22	0	0	Ecliptic conj. or ● New Moon.
24	22	0	0	♂ in conj with ε in Gemini.
25	10	0	0	☿ in conj. with κ in Gemini.
25	12	0	0	♀ in conj. with ε in Taurus
25	22	0	0	♂ in conj. with ♄ long 8° in Cancer ♂ lat. 55' N. ♄ lat 30' S. diff. of lat. 1° 25'
25	0	0	0	Clock before the ☉ 2' 3"
27	3	0	0	☽ in conj. with 1 α in Cancer
27	5	0	0	☽ in conj. with 2 α in Cancer
28	12	0	0	☽ in conj. with π in Leo.
30	0	0	0	Clock before the ☉ 3' 5"
30	13	0	0	☽ in conj. with ν in Leo.

The waxing ☽ moon—the waning moon ☾

Rotherhithe. **J. LEWTHWAITE.**

METEOROLOGICAL JOURNAL FOR APRIL AND MAY, 1827.

1827.	Thermo.		Barometer.		Rain in inches.	1827.	Thermo.		Barometer.		Rain in inches
	Hig.	Low	High.	Low.			Hig.	Low.	High.	Low	
APR.						MAR.					
26	51	24	30,10	29,99		11	61	41	29,85	29,66	
27	58	28	30,19	30,14		12	60	34	30,00	29,97	
28	67	32	30,18	30,00		13	59	32	29,89	29,79	
29	74	39	29,94	29,90		14	53	43	29,77	29,70	
30	77	38	29,93	stat.		15	60	44	29,68	stat.	,05
MAY.						16	67	39	29,58	29,38	,05
1	76	49	29,94	29,93		17	64	46	29,53	29,46	,125
2	66	43	29,94	29,88		18	67	50	29,68	29,53	,425
3	73	43	29,83	stat.		19	71	50	29,90	29,77	
4	66	45	29,78	29,74		20	70	43	29,96	29.92	
5	59	48	29,60	29,46		21	75	42	30,03	30.00	
6	55	46	29,28	29,10	,15	22	66	47	30,03	29,95	
7	55	41	29,68	29,54	,6	23	68	48	29,90	29,62	,025
8	51	31	29,77	29,73		24	63	48	29,46	29,28	,05
9	50	32	29,73	29,71		25	62	39	29,28	stat.	,1
10	58	34	29,70	stat.							

LOWER EDMONTON. **CHARLES H. ADAMS.**

Lat. 51° 37' 32 N. Long. 0° 8' 51" W. of Greenwich.

LITERARY AND SCIENTIFIC NOTICES.

Dr. Edward Harrison has in the press a work, to be entitled Pathological, and practical observations on spinal complaints, &c. and an inquiry into the origin and cure of distorted limbs.

The King of France we learn has given directions for the publication of the Voyage Round the World, during the years 1824, 1825 and 1826, in the Thetis frigate, and Esperance brig, under the command of the Baron de Bougainville. The work is to be in quarto, illustrated by thirty plates; the subjects of which are Natural History, views of places where the expedition touched, costumes, &c. and an Atlas of eight large maps.

A work is announced for early publication, under the head of Rambles in Madeira and Portugal, during the early part of the year 1826, which will contain a History of the Island, some account of the climate and the produce thereof, the talent of Westall, Nicholson, Villeneuve, Harding, Gauci, &c. are employed on the illustrations to this work. All of which are taken from sketches made on the spot, depicting the most remarkable scenes and objects in the Island. The whole of which will be executed in lithography.

Mr. J. P. Neale has been engaged for some time past in making views of several interesting mansions, for the purpose of completing the "Views of Gentlemen and Noblemen's Seats," which he intends to resume the publication of in the ensuing Autumn.

The Rev. Dr. Russell is about to publish in two vols. octavo, the connection of sacred and profane History, from the death of Joshua, until the decline of the Kingdoms of Israel and Judah; intended as a completion to the works of Shuckford and Prideaux.

Mr. Peter Nicholson, author of many scientific works, is engaged on a new work to be published in Nos. a New Treatise entitled, the School of Architecture and Engineering.

Part twenty-five of Lodge's Portraits of illustrious persons, has been published as rich in treasures of art, as those parts that have preceeded it; among its contents will be found Portraits of Lucius Carey, Lord Falkland from Vandyke, by J. Thomson, Ridley, Bishop of London, by H. Robinson, W. Villiers, Lord Grandison from Vandyke, by H. R. Cook, Spencer Compton, Earl of Northampton, by T. A. Dean and Robert Berlie, Earl of Lindsey, from Vandyke, by E. Scriven. The engravers have done justice to the paintings, as well as credit to their own talents.

Sculpture.—Mr. Lough the talented individual, whose pursuits of this branch of art in privation and obscurity, has been brought to notice by the daily and periodical Journals, it is said, has met a patron in the person of H. Brougham, Esq. who has engaged him to produce a stupendous Sampson for him; we hope the production will please the patron, and verify the predictions entertained of his gifted abilities, that he will become at no very distant period, one of our first sculptors.

No. 11, of the Parts of England, engraved in mezzotinto, from original drawings, made expressly for the work, by J. M. W. Turner, R.A. by Thomas Lupton, has been issued from the press.

In the first number of this publication, there was all that could be desired by the admirers of fine drawings and engravings.

But the number under notice, we think surpasses the preceding one, and must call forth unmeasured praise, the objects on land are represented with great truth and solidity, and the skies and water are chef-d'ouvres of art.

The proprietors of that deservedly popular exhibition the DIORAMA, intend to re-open on the 4th June, with two new views, one "St. Cloud and the Environs of Paris," taken from Bas Meudon, and executed by Mons, Boulon: the other a fine "Ruin of a Church" with effect of a fog, painted by Mons. Daguerre. Though scarcely to be credited, it is in every point of view equal to the late exhibition of Rosslyn Chapel.

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No. LXXXI.

Recent Patents.

To SIR ROBERT SEPPINGS, *Knight, a Commander and Surveyor of our Navy of Somerset House, in the County of Middlesex, for his Invention of an Improved construction of such Masts and Bowsprits as are generally known by the name of Made-Masts, and Made Bowsprits.*

[Sealed 19th January, 1826.]

THE patentee proposes to construct masts for ships of the line, frigates, and the larger description of merchantmen, by combining pieces of small squared baulk timber, and securing them together with iron hoops, bolts, and tree nails, and such other fastenings, as are capable of keeping the pieces firmly combined. It is stated by way of recommendation, that masts constructed in this way, will be much less expensive than those cut out of solid beams of fir as is usual, and that they are found to be equally strong or stronger; they can also be more easily repaired in case of accident, will be found to possess greater durability, and may be more conveniently exported, or sent from place to place in parts.

For ships, the masts of which are required to be above thirty three inches diameter, it is intended to combine twelve squared pieces together in the following way:—let four long pieces be securely united forming a square, fastened together by diagonal tree nails, then upon each of the sides attach two similar pieces, and make them fast to the former. Shave off the edges, so as to bring them on the outside to form segments of a circle; then bind them round with iron hoops, and fill up the vacant angular spaces with dead wood, thus finishing the mast in a circular figure.

In producing the length of the mast, many of these baulk timbers are to be joined together, by butting their ends, and inserting pieces of iron in mortices, taking care that the joints are well blocked, that is, crossed by the solid parts of the next pieces adjoining.

For vessels carrying masts of smaller diameter than those above mentioned, a lesser number of baulk timbers may be combined, in the manner above described; and it is proposed to reduce both ends of the mast, in order that it might be reversed if occasion should require, but this the patentee does not claim as new.

[*Inrolled March,* 1826.]

To Jane Antoine Teissier, *of Tottenham Court Road, in the County of Middlesex, Gentleman, in consequence of a communication made to him by a certain Foreigner residing abroad, for certain Improvements in Steam Engines.*

[Sealed 15th September, 1825.]

The subjects comprehended under this patent, are 1st, certain peculiarities in the construction of boilers for generating steam, and 2ndly, a very simple mode of erecting and adapting a steam engine for the purpose of propelling vessels or water, or for any other mechanical purpose.

The boiler is formed by combining certain contrivances already known and in use, as will be perceived by reference to James's Patent, Vol. XII, page 290, Gurney's Patent, page 77, of the present Vol. and several others, but which are proposed to be adapted in a novel way. Plate X, fig. 1, represents the boiler, parts of which are drawn in section, for the purpose of exhibiting the internal construction; *a, a, a,* is the upper part of the boiler or waggon formed vessel, in which the steam collects; *b,* the pipe for supplying the boiler with water, which it is proposed should be previously heated in an auxiliary vessel, and pumped into this at a considerably elevated temperature, in order to prevent condensation; *c,* is the pipe that conducts the steam from the boiler to the engine, and *d, d,* are safety valves, placed in the upper part of the boiler, with weighted levers as usual.

It is proposed that there should be several distinct furnaces under the boiler, each surrounded with tubes containing water, and that these should be so connected to the boiler *a,* by means of screwed joints with stop-cocks, that any one of the furnaces and its system of pipes may be put out of action without interrupting the performance of the other parts of the boiler.

The doors of the several furnaces are represented at *e*, *e*, *e*, where the fuel is introduced, and *f*, *f*, is one of the furnaces shewn exposed, by that part of the boiler being represented in section; *g*, *g*, *g*, are parallel chambers formed of plate iron, placed round the top and sides of each furnace, which chambers are filled with water, and communicate with each other, and with the boiler, by means of bent tubes *h*, *h*, *h*.

The furnaces are each surrounded by a series of ring-formed pipes *i*, *i*, which are inserted into horizontal tubes *k*, *k*, at the upper and lower parts of the furnace, the pipes forming grate-bars supporting the fuel, and between which the draft of air passes to maintain the fire. There is a perpendicular pipe *l*, at the back and front of each furnace, which also form open communications between the upper and lower tubes *k*, *k*, and the tubes *m*, *n*, when connected to the upper tubes *k*, form communication between the furnace pipes *i*, and the waggon head vessel *a*.

The boiler being so constituted, the water has free communication through all the pipes, tubes, and chambers, and the ebulition produced in the pipes and tubes immediately in contact with the furnace, causes the steam to rise into the upper part of the waggon head vessel, and to proceed from thence through the pipe *c*, to the working cylinder of the engine, intended to be connected therewith.

In order to clean any one of the systems of ring-formed pipes *i*, *i*, or to repair them if necessary, the stop-cocks at the tops of the tubes *m*, and *n*, are to be closed when the connecting joints may be unscrewed, and the furnace with its system of pipes withdrawn from the boiler: which will not interrupt the action of the other furnaces, but allow the boiler to generate steam as usual, excepting a reduction in quantity, from the absence of one of the furnaces. *o, o*, are hoops with longitudinal bars, placed round the systems of pipes, which constitute a cradle, supporting and protecting the pipes, and this cradle being enabled to open by joints in the middles of the hoops, allows the pipes to be removed. The heated vapour and smoke passes along at the backs of the furnaces, and proceeding upwards, enters into the flue *p*, which is a tube entirely surrounded with water, in the upper part of the boiler or waggon head, and passing along this flue, it communicates its heat to the water, and ultimately escapes into the chimney. This construction of boiler is particularly recommended for steam vessels.

A modification of the same principle of construction, but in a simpler way adapted, is shown in the section of a boiler, fig. 2; *a*, is the head or steam receptacle, formed as a cylindrical vessel, from whence two lateral chambers, *b, b*, proceed in an angular direction, and terminate in the tubes *c, c*. A series of bent pipes *d, d*, extend from the upper vessel *a*, and enter the central tube *d*, at bottom. The furnace is placed within, as at *e, e*, and the flames passing between the pipes, strikes against the under surfaces of the chambers *b, b*, from whence the heat is reflected back to the pipes.

The flame smoke, and other heated vapours, proceed through the interior of the furnace, and turning round at the end, pass along the flue *f*, then round in front and along the flue, *g*, heating the outer surfaces of the chambers *b, b*, whence it escapes to the chimney. The vessels being all occupied with water, ebulition takes place by the action of the fire, and the steam evolved collects at top, and then passes by a steam pipe to the working cylinder of the engine.

Another construction of boiler is proposed, in which sea water may be used; fig. 3, is a section of the boiler of a waggon form: *a, a,* is the furnace in the interior; *b,* the waggon head or steam receptacle at top; *c, c,* parallel chambers on the sides through which the water flows; *d, d,* diagonal passages extending from the upper part towards the bottom of the boiler; and *e,* a perpendicular chamber passing along the middle. These chambers and passsages being all filled, the water is made to boil by the heat of the furnace within, the flame and heated vapour from which proceeds round and through the chambers, as shewn by the arrows, and ultimately escapes at the chimney. By this peculiar construction of boiler, the salt, which becomes concentrated in the sea water by the boiling, slides down the sides of the diagonal passages, *d d,* and descends to the bottom of the vessel *c,* below the fire, where it remains to cool, and may be occasionally removed, by drawing off the water, and opening doors in the ends. In this way the deposition of salt upon the internal surface of the boiler, which is found to be so very injurious, is intended to be prevented.

The improvement purposed in the steam engine, which constitutes the second feature of the patent, consists in simplifying the construction, by altering the form and disposition of the rods, levers, and framing of the engine, and adapting them in the manner shewn at fig. 4: *a,* is the working cylinder; *b,* a sweep rod, connected by a cross-bar, *c,* at top, to the piston rod, and at the lower end to the triangular lever, *d.* The reciprocating strokes of the piston cause the triangular lever to vibrate upon its fulcruum, *e,* and a rod, *f,* being connected to the triangular lever, by a joint at *g*, and also to the crank *h*, upon the main axle *i*, the reciprocating action of the piston produces a rotatory action of the shaft.

The paddle wheels, if the engine is intended to propel vessels, being attached to the shaft, *i*, will, by the action of the piston, be carried round, or any other machinery being connected to the axle, will be driven in the same way as by other steam engines.

The steam is communicated to the cylinder by a pipe *k*, leading from a boiler, and the induction and eduction valves are worked by the rod *l*, which is slidden to and fro by an eccentric upon the main shaft.

Inrolled March, 1826.

To Isaiah Lukins, *late of Philadelphia, but now of Adam-Street, Adelphi, in the County of Middlesex, Machinist, for his new-invented Surgical Instrument, for destroying the Stone in the Bladder, without cutting, which he denominates "Lithontriptor."*

[Sealed 15th September, 1825.]

This surgical instrument is described in the specifications as a new and useful improvement upon an instrument introduced recently at Paris, by M. Civiale, M. D., denominated the "Lithontriptor," for the purpose of effecting the destruction of stones in the bladder without the operation of lithotomy; the instrument of Dr. Civiale consists of a straight cylindrical cathetor, or tube of silver, or other metal, in which is inserted another tube of steel, having at its end three curved elastic branches or prongs, which remain closed when in the exterior tube, but when pushed forward, open by their elasticity, forming a kind of cage in which the stone is made to enter. The branches or prongs are then closed upon the calculi they have enveloped, by drawing the outer tube towards the operator; and when the stone has by these means become firmly fixed, drills and files are introduced through the hollow tube for the demolition of the calculi.

The features of novelty claimed by the patentee, are shewn in Plate XI. fig. 1, and consists in adapting to the apparatus four elastic branches, with fine springs of steel fastened to the ends of two of the branches by hinges, and which springs pass across each other in a looped form, through eyes at the end of the other two elastic branches, and proceed thence along the interior of the tube until they reach the handle, and pass out of the tube through a small tranverse hole in a collar sliding between the handle and the end of the instrument.

By drawing this collar back, the elastic branches or prongs may be brought together, and the whole readily introduced through the cathetor or conductor into the bladder, when the branches expand; the springs then being pushed forward by the operator, a basket receptacle is formed, by the looped springs, to receive the stone. The springs are then drawn tight, and fastened by a screw inserted in the sliding collar. Square pointed drills are then introduced along side of the springs through the interior of the tube, for the purpose of cutting the calculi into small pieces: the drills are furnished with a small collar to prevent their being incautiously used.

Another form of instrument, termed duck-bill forceps, shewn at fig. 8, is contrived for bringing away remaining fragments of stone, which is effected by passing the instrument through the conductor. This instrument consists of two metal tubes, one within the other, the exterior tube having two elastic branches or spoon bills opening outwards, which are smaller at their base; a small ring or collar embraces the bills, leaving them open at their extremity. The inner tube has two slender branches attached inside the ring or collar, and by pushing this tube forward, the collar slides up the bills, and closes them upon the fragments, so as to enable them to be withdrawn from the bladder.

Fig. 1, represents the basket forceps; fig. 2, the conductor, having one end funnel-shaped, its length being about ten inches; and fig. 3, the duck-bill forceps; *a, a*, are the basket forceps; *b, b, b, b*, are the elastic prongs, differing in length; *c, c*, are the hinges to which the springs are attached; *d*, the crossing of the springs; *e, e*, the eyes, through which the springs pass into the interior of the tube; *f*, the hole where they pass out; *g*, the sliding collar to which the springs are fastened; *h*, a small screw, to secure the collar; *i*, the handle; *k*, a collar, with a screw to keep the conductor in its place: *a*, fig. 3, the duck-bill forceps; *b*, the bills; *c*, the inner tube; *d*, the outer tube; *e*, the collar attached to the branches of the inner tube, for closing the bills; *f*, the ring or handle.

Several variations in the forms of instruments, for the same purpose, are set forth in the specification, which are, however, the same in principle, and render further description unnecessary, as the above contains the material parts of the improvement.

[*Inrolled, March,* 1826.]

To CHARLES JACOMB, *of Basinghall Street, in the City of London, Wool Broker, for his Invention of certain Improvements in the Construction of Furnace Stoves, Grates, or Fire Places.*

[Sealed 15th September, 1825.

THE intention of the patentee is to construct grates for ordinary domestic use, or for steam boilers, in such a manner that they may be charged at one time with fuel sufficient for the whole day's consumption, or for any other space of time that may be required. To effect this object, a cage, formed by bars, is to be made either of a cylindrical or other convenient figure, and is to be suspended upon an axle or pivots, so as to allow of its revolving. This cage may be divided into several compartments, and when the whole has been filled with coal, coke, or other combustible material, and the grate placed in its proper situation, the fuel is to be ignited at the top of that one of the compartments which stands uppermost.

In this situation the grate is to remain, the fire burning downwards, until nearly the whole of the fuel in that compartment becomes consumed, then the grate is to be gently turned round, allowing the fuel in the next compartment to ignite by its contiguity to the fire in the nearly expended compartment, and so on, until the fuel in all the compartments has been consumed.

By this contrivance, it is intended that the smoke and other combustible vapour emitted from the coal shall become burned in passing upwards through the fire, and consequently that no smoke will pass up the chimney, or into the apartment.

Plate X, fig. 6, shews one mode proposed by the patentee, of constructing his improved apparatus: *a, a*, is the cylindrical cage or grate, made by attaching the grate bars to circular ends; *b*, is a hollow axle affixed to the ends and forming the pivots upon which the grate is intended to revolve. That part of the hollow axis which is within the grate is made of bars allowing the free passage of air to the under side of the fuel, and also permitting the clinkers and dust to fall through.

This cylindrical grate is divided into three compartments, and the fuel is admitted to each at the doors in the end. The fuel, as before said, is to be ignited at the top of the upper compartment, and allowed to burn downwards; and when nearly consumed, the grate is to be turned round, and the fire allowed to communicate to the fuel in the next compartment. The air to supply the draft, or occasionally a powerful blast of wind, or steam, may be passed into the hollow axis for the purpose of urging the fire.

In the way represented the grate is suited for domestic use, but the same may be applied for generating steam, by having a recess in the boiler capable of receiving the cylindrical grate, and bearings at the ends, by which it may be allowed to turn round.

The patentee proposes to construct revolving grates of other forms, as in square cages, having doors at the upper and under side, for the introduction of fuel, and to support them upon pivots in bearings of any convenient or tasteful form suited for domestic purposes. The claims of invention are not for any particular forms of grates, but for constructing them in such manner as shall allow of their turning upon pivots in bearings.

[*Inrolled, March,* 1826.]

Precisely the same plan as the above, a rotatory grate for consuming its own smoke, constituted the subject of a patent for improvements on grates, granted to a Mr. Spencer about ten years back. EDITOR.

To JACOB PERKINS, *of Fleet Street, in the City of London, Engineer, in consequence of a communication made to him by a certain Foreigner residing abroad, for certain Improvements in the construction of Bedsteads, Sofas, and other similar articles.*

[Sealed 11th August, 1825.]

THIS invention is a ratchet-wheel and click to be adapted to the rails and posts of bedsteads, for the purpose of enabling the rails to which the sacking is attached, to be turned round as it were upon their axes, by means of a lever, and then held by the click, which contrivance is for the purpose of drawing the sacking tight, and by that means also keeping the joints of the rails and posts firmly together.

Plate XI, figs. 4 and 5, represent the apparatus in two positions; *a*, is the upright post of the bedstead; *b*, the horizontal rail; *c*, the rim, with the ratchet on its upper edge, affixed to the rail *b*; and *d*, the click hanging from the post. The sacking of the bedstead is to be attached to the horizontal rail *b*, by tacks as usual, there being a recess formed in the rail to receive it. At each end of the rail *b*, a rim *c*, is affixed, and a pin or projecting part at the back of each rim, is let into the upright posts and there acts as the pivots on which the rail turns.

When the sacking requires to be drawn up tight, a lever is put into the hole through the rail, and the rail turned round, the ratchet *c*, passing under the click. When the sacking has been drawn sufficiently tight, the lever is let go, and the click falling into the teeth of the ratchet, the rail is held tight, and the tension of the sacking keeps the joints of the bedstead perfectly secure.

[*Inrolled February*, 1826.]

To GEORGE CHARLETON, *of Maidenhead-Court, in the Parish of St. John, Wapping, and* WILLIAM WALKER, *of New Grove, Mile End Road, in the Parish of St. Dunstan, Stepney, both in the County of Middlesex, Master-Mariners, for their Invention of certain Improvements in the building or constructing of Ships or other Vessels.*

[Sealed 10th August, 1825.]

THE principle feature of this invention appears to be, the constructing of ships with straight timbers, which is said to be productive of great advantages, as to strength, durability, and cheapness. It would be perfectly uninteresting, were we to rehearse all the particulars which the patentees have set forth in their specification, by way of directions to shipwrights, respecting the disposition of the timbers, &c. in building ships upon their improved plan, we shall therefore merely mention the several heads under which the improvements are comprehended.

First, in employing straight timber to construct the ribs, beams, and other parts which constitute the skeleton of the ship, chocks are to be employed as supports or trusses, cut out of solid timber. These are particularly to be introduced at the lower parts of the vessel, to "support the sweep at the floor head." Ships so constructed will experience no inconvenience from strains or hogging, and indeed no shocks will effect the vessel, but such as would actually destroy it.

Second, it is proposed, to give additional strength and security to the flat part of the bottom within, by confining it to the timbers by tree nails and bolts, and introducing futtocks on the sides supported by chocks, bolted to three keels, which are combined together, with felt between, upon the plan of Wood's patent.

Third, securing the beam ends on the several decks in the manner recently introduced by the French, (which is not described in the specification,) and adding planking to give additional strength, which the patentees consider as an improvement invented by them.

Fourth, a method of laying the deck planks upon a new principle, which is to secure them by placing thick stringers in the decks, fore and aft of the vessel.

Fifth, leaving spaces between the beam ends and other timbers for ventilation, by which a free circulation of air is admitted. The orifices of these air passages to be closed in foul weather.

Sixth, raised chocks are to be affixed to the bottom of the hold, for the purpose of supporting the cargo, and keeping it from the water, which may be in the bottom of the hold. By these means a greater space will be left for the water, without subjecting the cargo to injury, and avoiding the necessity of drainage.

[*Inrolled, February,* 1826.]

To ABRAHAM ROBERT LORENT, *of Gottenburgh, in the Kingdom of Sweden, Merchant, at present residing in King Street, Cheapside, in the City of London, for his Inventions of a method of applying Steam without pressure to Pans, Boilers, Coppers, Stills, Pipes, and Machinery, in order to produce, transmit, and regulate various temperatures of Heat, in the several processes of Boiling, Distilling, Evaporating, Inspissating, Drying, and Warming, and also to produce Power.*

[Sealed 19th January, 1826.]

THE method proposed of heating pans, boilers, &c. by means of steam, without pressure, is by allowing the steam to have a free exit after having circulated under the pans, which may be applied in various ways. One plan suggested by the patentee of adapting his invention, is shewn in Plate X, fig. 5, where a section of an apparatus for concentrating sugar is represented; *a*, is a steam boiler of the ordinary construction, but having no safety valve, as there will be no pressure exerted within; *c*, is a double vessel or pan with a jacket, the outer vessel being two inches from the inner one, for the purpose of allowing the steam to circulate between the two. This vessel is set in brick work over a fire; *b*, is a pipe conducting steam from the boiler to the passage between the vessels; the bottom of the outer pan, or jacket, is subjected to the action of the fire, in order to raise the steam, as it passes, to that degree of temperature necessary for boiling the contents of the inner vessel. After acting on this first vessel, the steam passes off by a pipe, *d*, to the next double pan, or boiler, *e*, and from thence to another similar double pan, *f*, by the pipe, *g*, to a fourth pan, *h*, when, if there should not be any more vessels requiring the heat, the steam is allowed to pass off, and escape, by the exit pipe, *i*; but in case the contents of the third pan, *f*, require the action of steam of a much higher temperature than was exerted on the pan, *e*, fire is to be applied to the bottom of the outer pan, *f*, for the purpose of heating the steam to the required temperature. Cocks are to be attached to the bottoms of the outside pans, in order to draw off any condensed water that may have accumulated in them.

When steam of a high degree of temperature is to be applied at a distance from the boiler *a*, for the purpose of actuating machinery, the patentee proposes to employ boxes or vessels, which he denominates "*steam heaters*," one of which is seen at *k*, set in brick work over a fire as an ordinary boiler, and steam being admitted into this heater from the boiler *a*, by the pipe *l*, receives the action of the fire, and is conducted by the pipe *m*, at a very high degree of temperature to the cylinder of a steam engine, or any other machine where the action of steam may be required.

The steam heaters may be formed of various sizes, shapes, and materials, according to the temperature of the steam required; the outside pans may be made of cast iron, or any other strong metal, or fire clay, cement, or artificial or natural stone, and the inner pans of very thin metal, or sheet copper, which is soon heated, by these means a great saving in the consumption of fuel is proposed to be effected.

The patentee concludes by saying, that he claims as his invention, "the application of steam, heated to various degrees of temperature, by its free and gradual contact with, and passage over one or more surfaces, heated by a separate fire, and without any further accession of aqueous particles and process subjected to pressure or confinement."

[*Inrolled, July*, 1826.]

By what means the patentee intends to obtain mechanical force for working his steam engine we are at a loss to discover, as the leading feature is, that the steam shall exert no pressure. If he has discovered that steam, without exerting pressure, is capable of producing mechanical force, or power, he has, indeed, made a discovery.

To JOHN HARVEY SADLER, *of Hoxton, in the County of Middlesex, Mechanist, for his Invention of an improved Power-Loom for the Weaving of Silk, Cotton, Linen, Wool, Flax, and Hemp, and Mixtures thereof.*

[Sealed 31st May, 1825.]

THE object of the patentee is to give motion to the operative parts of a loom, by means of a rotatory power so applied, that its mechanism shall occupy no greater space than is required for the standing of an ordinary hand-loom. To effect this object, the main rotatory shaft, which receives its motion from a steam engine, or other first mover, is placed at the top of the loom, and by means of cams and tappets affixed to the main shaft, the heddles are moved up and down, which open the sheds of the warp, the lay or batten is made to oscilate, and the shuttle is projected to and fro at the proper intervals of time.

Plate XI. fig. 8, is an elevation of the front of the loom; fig. 9, is a horizontal or bird's-eye view of the loom as seen looking upon it from above; *a, a,* is the main rotatory shaft, receiving its motion from any first mover by the toothed wheel, *b*, or by a rigger placed in that situation; *c, c*, are the heddles or harness, attached by cords to the levers at top and bottom, as usual, and which are drawn down by strong helical springs, *d, d.* In order to raise either of the heddles, one of the tappets, *e, e*, affixed to the main shaft, as it comes round, strikes upon the end of one of the levers, *f, f*, and by depressing that end, raises the other, and with it the heddle connected thereto. On the tappet escaping from the end of the lever, the spring *d*, draws its heddle down and the other tappet *e*, now acting upon its lever, the other heddle is raised, and so on, the heddles being alternately raised and depressed by these means, as the main shaft revolves, and the sheds of the warp accordingly opened for the passage of the shuttle.

The oscilating movements of the lay, or batten *g*, are performed by a cam or tappets *h*, on the middle of the rotatory shaft *a*, which, as they go round, act against the lever *i*, at the back of the lay; and this lever being connected to the frame *k*, which is affixed to, and stands out from the top of the lay, nearly at right angles to it, every time that the end of the lever *i*, is depressed the lay is thrown back, allowing the shuttle to pass in front of the reed; and where the lever *i*, is released from the tappet the lay falls forward by its own weight, and beats up the weft. This is performed twice in every revolution of the main shaft.

The throw of the shuttle is effected by the cams or snails, *j, l*, affixed on the rotatory shaft, *a*, which cams have inclined plains acting against the ends of the levers *m, m*, and these are connected to other levers *n, n*, and to pendent arms *o, p*, at the lower extremities of which the peckers are attached by small cords. To the upper parts of the pendant arms *o, p*, the ends of a powerful helical spring *q*, are made fast, and the pendant arm having been forced outwards, as at *o*, by the action of the inclined plain *j*, the moment that the end of the lever *m*, escapes from the inclined plain, the spring *q*, draws the pendant arm *o*, with a sudden jirk inwards, which causes the pecker, at the bottom of the arm, to strike the shuttle a smart blow, and drive it across the lay in front of the reed. A similar action of the cam *l*, upon the lever *m*, causes the pendant arm *p*, to strike the shuttle back again, and thus as the main axle revolves, the process of weaving is carried on; the giving out of the warp from the roller *r*, and the taking up of the work by the roller *s*, being effected by any of the ordinary methods.

In case of the shuttle not proceeding to its destination, but stopping in the race in front of the reed, there is a contrivance by which the movements of the loom will instantly stop. Under the shuttle race in the lay, there are two small levers, over which the shuttle passes, and to these is attached a pin in the middle of the race. If the shuttle goes to the end of the race, its weight lifts the lever and the pin; but if the shuttle stops short of its destination, the levers* and the pin are not raised. The pin passes through the bottom of the lay, and rests in a small hole in a piece of wood beneath, to which piece of wood a string is attached, that goes over a small pulley *t*, on the side of the standard, and is made fast to the lower end of the perpendicular lever *u*. Now, if the shuttle stops as above said, in the race, the levers are not raised, consequently the pin locks the lay, and the pieces of wood beneath together; and as the lay goes back by the action of the loom, in the manner described above, the string draws the lever *u*, out of its perpendicular, and causes the upper end of that lever to slide a clutch box, which puts the shaft *a*, out of gear with the toothed-wheel *b*, and the movements of the lever instantly cease.

There are small variations proposed in the disposition of the parts of the loom, to enable it to weave twilled or figured goods; but as the principles of action are the same, we consider it unnecessary to extend the explanation further.

[*Inrolled, November*, 1825.]

To John Bowler, *of Nelson Square, Blackfriars' Road, in the County of Surrey, and* Thomas Galon, *of the Strand, in the County of Middlesex, Hat-Manufacturers, for their Invention of certain Improvements in the Manufacture of Hats.*

[Sealed 27th August, 1825.]

The patentees state, that hats made in the ordinary way are very apt to break at the brim, being considerably weakened by the stitching of the leather lining; and that this is particularly the case with hats worn by sportsmen, travellers, and such other persons as expose them considerably to the weather, and very frequently handle their hats. To remedy this evil, the patentees propose to make the brims of their hats double, by placing an additional thickness of felt upon that part of the foundation which is to form the brim.

The felt, which is to form the foundation of the hat, is made of a conical figure; but those felts which are to constitute the additional brim, are to be made cylindrical. For this purpose long cylindrical felts are to be prepared, and afterwards cut into several cylindrical bands, and one of these bands is to be attached to each of the conical foundations of the hats, and stretched out so as to fit and lay close to the surface of the conical felt.

The additional brim is to be attached to the inside of the foundation of the hat, by diagonal stitches, and then to be worked in the hot liquor with the foundation, turned inside out, by pressing and rolling, as hats are usually made. It is then to be shaped, blocked, stiffened, died, and covered, as in the ordinary way of making either beaver or silk hats.

The patentees further propose to make the bodies of hats with double felts, in order to give additional strength. In which case they prepare the foundation, and placing one within the other, they work them, block them, and stiffen them, as one hat, and fasten the two surfaces together by the water-proof cement, or varnish, commonly employed for stiffening hats, and for sticking on the silk shag with which hats are usually covered.

It is only necessary further to remark that these double felts are to be much thinner than ordinary foundations, in order to render the hats light; and it is intended that the additional brims shall be made to turn up an inch or two within the crown, and be thinned towards the edge, to avoid forming a rib or projection round the hat.

[*Inrolled, February,* 1826.]

To Henry Richardson Fanshaw, *of Addle Street, in the City of London, Silk-embosser, for his invention of Improved Apparatus for Spinning, Doubling, and Twisting or Throwing Silk.*

[Sealed 12th August, 1825.]

The subjects of this patent are described as consisting of four particulars, first, a new arrangement or disposition of vertical and horizontal bobbins, to be employed for the purpose of spinning and doubling silk; second, a new mode of forming the flyers for guiding the threads on to the bobbins; third, a contrivance for throwing the bobbins in and out of action; and fourth, a mode of retaining the horizontal bobbins against the bearing board.

Plate XI, fig. 6, shews the arrangement of the several parts of the machine; *a, a,* are the vertical bobbins turning loosely upon the spindles *b, b,* which with the flyers *c, c,* are made to revolve by means of the cords extending from the rotatory pulley *d.* The silk passes from the bobbins *a,* upwards, through eyes *e,* over a glass rod *f,* between the drawing rollers *g,* which arrangement of the parts so far is the same as in ordinary machines for throwing silk.

The silk threads from the two or more bobbins *a, a,* are delivered from the drawing rollers to the bobbin flyer of the horizontal bobbin *h,* which being turned by a cord from the before-mentioned pulley *d,* causes the silken threads to be doubled and wound upon the horizontal bobbin, the traversing of the bearing plate *i,* causing the bobbin to be slidden along the spindle so that the silk shall be evenly wound upon the bobbin.

Such is the disposition of the machinery, which though not new, in its separate parts, is herein claimed as new in its arrangement, and is employed in the way described for the production of Organzine or sewing silk, but when another description of silk is to be prepared called Bergam, then only one of the vertical bobbins is to be put in operation, and another thread is to be drawn from the stationary bobbin *k.*

When very delicate threads are to be twisted and doubled, it is proposed to use a flyer similar to that shewn at fig. 7, with the ends turning down, and forming loops or eyes for the fine threads to pass through.

In case of any of the threads breaking, it will be necessary to stop the bobbin connected with it. This is done by moving the lever *l*, which turns upon the fulcrum pin *m*, fixed in a stationary bar crossing the machine. This lever embraces a clutch box *n*, attached to the rotatory shaft on which the pulley *d*, turns, and by moving the lever *l*, to the right or left by the handle *o*, the pulley *d*, is locked into gear with the rotatory shaft, or taken out of gear, and made stationary.

As any sudden starting of the bobbins would endanger breaking the threads, it is contrived that the pulley *d*, shall be gradually put into gear, which is done by a circular inclined plain on the face of the pulley, and a pin on the inner side of the clutch. The clutch being slidden by the lever towards the pulley, its pin moves upon the circular inclined plain until it comes to the end, and there striking against the raised edge, carries the pulley round with it. The lever is held in its proper position by a spring catch at *o*.

The bobbin is held against the bearing board by a spring latch *p*, which falls into a groove at the foot of the bobbin.

The claims of the patentee are, as stated above, the new arrangement of the bobbins; the flyers with the double arms; the mode of throwing the machinery in and out of action; and the mode for confining the bobbin to the bearing board.

[*Inrolled February*, 1826.]

To WILLIAM HENRY GIBBS, *of Castle Court, Laurence Lane, in the City of London, Warehouseman, and* ABRAM DIXON, *of Huddersfield, in the County of York, Manufacturer, for their Invention of a new kind of Piece Goods, formed by a combination of Threads of two or more Colours, the manner of combining and displaying such colours in such Piece Goods constituting the novelty thereof.*

[Sealed 23rd May, 1826.]

THE intention of the patentees, is to manufacture a kind of speckled fabric, composed of silk of two colours, or of silk and worsted, or silk and linen or cotton, or any other suitable material.

The mode of producing this fabric, is by twisting and doubling together two or more threads of silk of different colours, as black and white, and then employing these threads in the weaving, as the warp of the fabric, and shooting it with wool or any other material.

The piece goods made in this way, will be speckled, and the greater the contrast between the two coloured silks twisted together, the more brilliant the speckles will appear. According to the quantity of twist given to the threads, so will the speckles be long or short, and according to the number of threads twisted together, and their varieties of colour, so will the appearance and hue of the fabric vary; which it is quite obvious may be changed almost *ad infinitum.*

[*Inrolled July,* 1826.]

To JOHN EDWARD BROOKE, *of the Township of Headingley, in the Parish of Leeds, in the County of York, Woollen Manufacturer, and* JAMES HARGRAVE, *of Kirkstall, in the same Township, also Woollen Manufacturer, for their Invention of certain Improvements in, or additions to Machinery used in Scribbling and Carding Wool, or other Fibrous Substances.*

[Sealed 26th July, 1825.]

THE improvements proposed as the subject of this patent, chiefly consist in the employment of steam as a heating material in scribbling and carding wool.

The apparatus consists merely in placing vessels filled with steam, under the feeding cloth, the cylinders, and the doffer of an ordinary scribbling or carding engine. The steam is to be supplied from a common engine boiler, and conducted through a main-pipe to the several branch pipes which lead to the steam vessels, and thence from one vessel to another to the end of the range. In the first place, a flat steam box, is to be situated immediately under the feeding cloth, for the purpose of heating the wool previously to its entering the carding engine. Next curved steam boxes are to be placed as near as possible to the surface of the large cylinders, and partly embracing them at the under part of the machine. From thence steam pipes lead to the doffer cylinder, which is also partly embraced by a curved steam box.

By means of these steam vessels, the heat is made to radiate and enter the wool as it proceeds through the engine, and which is said to soften the filaments of wool or other animal material operated upon, and greatly to promote and improve the process of scribbling and carding.

The other object of the invention, is to smoothen the wool upon the doffer cylinder, before the sliver is taken off, and this is proposed to be done by a straight rod extending across the machine under the doffer cylinder, which rod is by a crank movement, made to roll against the surface of the doffer cylinder, and thereby to press the loose carded wool into a compact state.

There may be various modes devised of moving this rod in the way required, that proposed by the patentees, is by attaching the rod to two pendant jointed arms, and moving it in a sort of eliptical direction by a crank rod or eccentric, so as to roll against the wool upon the cylinder as it advances, and fall away from the wool as it recedes.

As the sliver of wool comes off the cylinder, by the action of the doffer comb as usual, it is conducted to the drawing rollers, and here again tubes with steam are introduced under the wool for the purpose of heating it. In this part of the operation, the steam is allowed to blow in amongst the wool in jets, through small perforations at the ends of the tubes, the moisture of which is found to improve and assist the drawing process.

[*Inrolled January,* 1826.]

To Richard Witty, *of Sculcoats, in the County of York, civil Engineer, for his Invention of an improved Chimney, for Argand, and other Burners.*

[Sealed 30th July, 1825.]

This invention is a conical or bell-formed tube, to be placed above the glass chimney of an Argand or other lamp, for the purpose of contracting the draft of the chimney at top, and thereby causing the lamp to burn with greater brilliancy than ordinary lamps, without consuming a greater quantity of oil than usual.

The conical or bell-formed tube may be made of glass, or of metal, and may be placed over the top of the cylindrical chimney, with its broadest part in contact with the chimney, or its narrowest part may be turned downwards, and inserted into the chimney. The object being merely to contract the upper part of the chimney in order to increase the draft of air, and thereby increase the brilliancy of the light.

[*Inrolled, January,* 1826.]

To Walter Hancock, *of King Street, Northampton-Square, in the County of Middlesex, Jeweller, for his Invention of an Improvement or Improvements in the making or constructing of Pipes or Tubes for the Passage or Conveyance of Fluids.*

[Sealed 16th July, 1825.]

The patentee intends to employ his improved processes in the manufacture of pipes or tubes, when made in the way proposed, either of metal or of wood. In forming pipes or tubes of metal, it is directed, that plates of iron be taken of any desired or suitable thickness, and that they be cut into lengths equal to the length of the intended piece of pipe, and of a breadth rather more than the circumference of the pipe. The plate is then to be turned back, or doubled on its edges, and afterwards to be bent into the cylindrical form required upon a mandrel, or rod. The parts thus brought nearly together, in parallel lines along the rod are the doubles of the edges turned back as described. The joint is then to be closed by a long narrow strip of the same kind of plate iron, turned over in like manner at the edges, and slipped on to the rebates as they may be called of the cylindrical pipe; the lips or doubles of one locking into the other, which are then to be brought closely together by hammering.

This mode of manufacturing the pipe will of consequence produce a ridge along the outside, but if that should be thought to be objectionable, the same mode of joining may be effected on the inside of the pipe, and then no ridge will be produced.

The joint is to be well hammered for the purpose of closing it so perfectly, as shall prevent the passage of any fluid, which the pipe may be employed to conduct. But if the hammering does not effect this in a satisfactory way a cement may be introduced into the joint, to make it completely close and tight. The cement proposed to be employed for this purpose is to be made by mixing certain quantities of rosin, bees'-wax, oil, tar, and tallow, and melting them together.

In order to render the pipes or tubes more secure, it is proposed to bind round the outer surface of them a narrow bandage of hoop-iron, in a spiral direction, and to make the ends of the binding-hoop secure by rivets. These may be coated with the cement; but in that case it is intended to mix with the cement, plaister of Paris, or pulverized lime, or whiting, in order to give it a greater degree of consistency.

In joining the pipes end to end, caps or collars are to be attached for the two ends to bed into, and these are to be filled and sealed up by the cement before described.

But in order to introduce the cement into the joint, it is intended to make one or more apertures in the ring, and to inject the cement by means of an iron syringe.

If the pipes are made of such materials as will allow it, tinning the interiors is proposed, to prevent the action of the atmosphere upon the metal; but at all events, their outer surfaces are to be guarded with a suitable coating of cement, made of the materials above described.

In forming pipes or tubes of wood upon the improved plan, it is proposed to place upon a cylindrical rod of the diameter of the intended bore, a sufficient number of spars, or slips of wood, and having shaved their outer parts to a smooth and even surface, iron bands are to be twisted round them in the manner above described; and this being done, the interstices are to be filled up with a cement made of caoutchouc, or elastic gum, dissolved in spirits of coal tar.

[*Inrolled January*, 1826.]

Original Communications.

To the Editor of the London Journal of Arts, &c.

Sir,—I beg to present to the public, through the medium of your Journal, an apparatus which I have invented, for the purpose of indicating when the quantity of water is so far diminished within a steam boiler as to render it dangerous. This apparatus may be called a tell-tale; it is perfectly safe, and sure of performing when required; it is constructed in a different and more simple way than the apparatus commonly called a tell-tale, which is employed for the same purpose as connected to steam engines.

In Plate XI, fig. 10, *a*, is a copper ball, which should be drawn together of one piece, or as nearly so as possible; the opening of the ball must be closed by brazing a piece on. I have found, by experience, if the ball is soldered with pewter solder, that a mineral acid, which water often contains, dissolves the solder, and the water gets into the ball, and renders it useless; *b*, is a hollow pipe, open at both ends, and fixed to the ball at the bottom, which is intended to let air pass in and out, and keep the ball from bursting; *c*, is a conical valve, fixed to the pipe *b*, which is shut by the force of the water in the boiler, pressing the ball upwards, excepting when the water is too low, and then the ball and the valve descend, and allow the steam to escape through the aperture of the valve, and in its escape it makes a terrible noise by blowing through a small opening *d*, which is constructed like an organ pipe stop; *e*, is the tube of the organ pipe screwed fast to the man-hole on the bottom. There are two holes, *f*, and *g*, through which the hollow pipe *b*, affixed to the ball, slides up and down; one of the holes, *f*, is made in a plate crossing the man-hole, the other, *g*, is in the lower part of a stay, or bar *h*, that keeps the ball under water. The dotted lines shew, the proper level of the water from which it must descend before the apparatus comes into action: the apparatus is generally screwed on the man-hole, or placed in some other part in or contiguous to the boiler.

When the water has boiled away so as to reduce its surface too low, the most dangerous consequences sometimes happens; the steam may then by its elevated temperature and high pressure, be compared to gunpowder, for the fire continues to gain power over it, and the remainder of the water in the boiler turns wholly to steam; and the safety valve being too small to allow its proper escape, an explosion is the consequence,—and even, if explosion does not occur, the boiler is so much injured, that it will not last the time it otherwise would.

I have found the apparatus, which I have above described during three years experience never to have failed, many of them have been applied to the boilers of kitchen ranges, some of which are made of iron, and have been heretofore subject to crack by the heat, when the water was low. And some of copper, which have occasionally become burned from want of water; but since this apparatus has been applied, nothing of the kind has occurred, and it has given general satisfaction, being sure to detect the negligence of servants, by the whistling noise it makes, which causes them to be more careful in keeping the boiler well supplied.

I am, Sir, your's, &c.

A. SIEBE.

To the Editor of the London Journal of Arts, &c.

SIR,—Seeing in the last number of your Journal, page 233, the report of a paper, presented by M. Clement, to the Royal Academy of Science, in Paris, on a newly observed phenomenon connected with steam valves, I have thought it desirable to request your insertion of the following remarks upon M. Clement's discovery, consisting of my own views on that subject, and I think a satisfactory explanation of the phenomenon, which appears not to have occurred to M. Clement, by the general tenure of his paper.

M. Clement, in his communication to the Royal Academy of Science, in Paris, on some singular results observed by him, connected with steam, observes, that when steam is greatly compressed in a boiler, so that a strong current is made to blow out through a small orifice, or a metal plate, or disc, being presented at a little distance from the orifice, it is forcibly repulsed; but if it is brought near, and pressed so as nearly to close the orifice, and cause the steam to escape in a star-like form round the outside of the disc, in radiant directions, an external pressure, will be found to act upon the disc, and it can only be set at liberty by forcibly raising it.

The phenomenon in steam, observed by M. Clement, is very curious, and at first sight appears unnatural; but nevertheless it is truly philosophical. In experimenting on high steam, particularly on the phenomenon of its rushing from the stop cock at so much lower a temperature than when in the generator, I observed that a strong current of air was constantly rushing into the stream of steam, and passing off with it, which was proved not only by its taking into its current atoms of dust, but also at a distance of six or eight inches it would draw the flame of a candle from its wick. This current of air would, of course, cool down the steam, and that in proportion to its velocity. Knowing this fact, it is easy to understand the cause of the disc being pressed so strongly against the aperture.

The steam passes off horizontally in every direction, as M. Clement observes, in a star-light form; now as a strong current of air will be created by the velocity of the steam, and pass off with it, (see the diagram, plate

XI,) the surrounding air will follow, and in its course, as at fig. 11, it will impinge on the disc and cause a pressure, and that in proportion to the height or velocity of the steam. When the safety valve is so constructed, which is sometimes the case, as to allow the steam to pass off in a horizontal direction, the pressure will be much greater than when the valve is conical, which gives a different direction to the steam, as at fig. 12, making it more difficult for the air to impinge in the valve. The valve placed on the generator of the high pressure safety engine is so small, and so nearly cylindrical, that the stream, when it issues from the valve, causes the molecules of steam immediately to join and form one volume, carrying the current of air upwards, as the steam passes nearly perpendicularly (see fig. 13.) No air can, of course, come in contact with the valve; probably a partial vacuum would be made immediately over the valve. This evil may be very easily remedied, by obliging the steam to rush into a tube rising twelve inches or more above the valve. In fact all steam boats are provided with a steam box, into which the steam rushes, which necessarily prevents the current of air from acting on the valve. The steam issuing from the safety valve would then pass off perpendicularly, and prevent the admission of the atmospheric air, which created the pressure in the disc observed by Mr. C. Mr. Penn, of Greenwich, has a valve affixed to his high pressure boiler, and it is so constructed as to have the steam pass off horizontally. Mr. P.'s son informed me, that he has observed the mercury to indicate an increase of from 80 to 100lbs. per inch, after the steam began to escape from the safety valve, it was undoubtedly from the above-mentioned cause. Science is much indebted to M. Clement for his discovery, for although this phenomenon has been observed in strong jets of water rushing from a fountain, as well as in strong currents of air rushing from the blower of a blast furnace, yet M. Clement is undoubtedly the first who observed it in steam, and also the first who has warned the public of the danger of using this kind of safety valve.

I am, Sir, yours, &c.

J. PERKINS.

Fleet Street, London.

To the Editor of the London Journal of Arts, &c.

SIR—As it seems from the communication I had from you this morning, that you have in common with others been led into an erroneous supposition, that I was the principal promoter of a meeting lately held at the London Mechanic's Institute, for the purpose of petitioning Parliament for some amelioration of the Patent Laws, I trust you will do me the justice to insert in your Journal, this explicit denial of the fact. I knew nothing of the meeting until ten minutes before it was announced to take place, when returning to my chambers from the Court of King's Bench, my Clerk handed me a note inclosing a card headed *Emancipation of Mechanical Genius*, and stating that a meeting was to be held at the London Mechanic's Institute, for purposes connected with the above object that day, and politely inviting me and my party in the usual terms, to seats on the platform. As the place appointed was so near to my chambers, I went merely out of curiosity, intending to be a silent observer of what might take place; on arrival at the Mechanic's Institute, I was requested to take the chair, but declined doing so, on the simple grounds that I knew not who were the promoters of the meeting, or what specific object they had in view, and stated at the same time that I had no intention of taking any part in the proceedings of the meeting, but only came on the invitation I had received as a mere spectator.

With this understanding, I entered the theatre, when it soon became very evident, that none of the ordinary requisites for a public meeting, had been procured by the promoters of it,—there was no chairman ready,—no stated object declared,— no resolutions prepared,—no movers, —no seconders,—no body in fact to take any lead in any way. My friend Dr. Birkbeck who was present after some hesitation consented with his usual philanthrophic disposition to set the machinery in motion by moving the first resolution, the object of which was to declare that the existing Patent Laws were bad, and required to be ameliorated. Dr. Birkbeck's address was clear and interesting as his speeches ever are, and excited considerable applause. I was requested to move the next resolution, but my good nature not being quite equal to that of my friend Dr. Birkbeck, I persisted in my determination not to take any part in the proceedings, but being known to many of the persons present, the call for me became too general for me to resist it, without absolute rudeness to the meeting, and this only induced me to take the part I did, and which led to the erroneous impression which I hope this explanation will entirely remove.

The result of this meeting was agreeing to a petition to Parliament to take the Patent Laws into consideration, and the appointment of a committee to wait upon some proper persons in the upper and lower Houses to present it; whether this has been done, or what further proceedings have been had, I know not, but that something ought to be done is most evident to every one acquainted with the present mode of granting letters patent for inventions. There is no country in this or the other side of the Atlantic, where the grants of patents of this kind are so badly regulated, and where the laws concerning them are so imperfectly administered as in this, with the exception only of Holland; and it is a just reproach to England, whose inventive genius has been successfully taxed in every quarter to maintain a competition with foreign markets, that this great source of her national wealth should be left unprotected by legislative enactments, and subject to the various and conflicting dicta of every newly created judge, while trifles like the placing of a flower-pot on your window cill, are made the subject of solemn acts of parliament. It is true that attempts have been made from time to time to bring the subject under the consideration of parliament, but it has always turned out that the promoters of these attempts have had some private end to serve by it, which has universally been the means of defeating their own plans. It is difficult to conceive how so eminent a class of persons as the engineers, and so powerful a body as the mechanics of England, should not, long since, have brought this important subject forward on public grounds, and compelled the legislature to attend to their grievances in this respect, by such an appeal as must ever be irresistible, when addressed to the British parliament from so valuable a body of the community.

The first great object to be effected by an Act of Parliament, would be, a definition of what is novelty in an invention, for on this point, nine-tenths of all patents that are litigated, are upset, and I am of opinion no better definition could be made than what is contained in the statute of Monopolies, namely,—*Any new Manufacture within this Realm, which shall not be in use at the time* *of granting the Patent,"* but which the decision of the judges have completely set at nought, and the consequence is, that valuable patents are constantly set aside by persons and often by *one* person only being found to swear that they used the invention some thirty years ago, though no one but themselves saw the produce of it, if a manufacture, or the engine, if it should be such. The common sense of the thing, would evidently be to grant patents for any invention which is not in *public* use at the time of granting the patent, or within such time as would make it easy to obtain evidence to refute the assertions of interested individuals, say twelve months, and allow all persons who can prove that they have privately used the invention before or within that time, to continue to do so without licence from the patentee. The late case of Daniell's patent for giving a lustre to woollen cloth, and which was upset by some *Cloth Dresser,* who must be considered as interested against the patent, stating that he had done the same thing thirty years ago, is a forcible illustration of the value of such an enactment as I have suggested.

In this case, a valuable article was sent into the market, which no cloth vender in the whole city of London had ever seen before, but because some one said he had produced the same effect thirty years ago, the monopoly was wrested from the patentee. Now I would ask, by whom was the public benefited? was it by this cloth dresser, or by the patentee? the answer is evident, by the patentee, who made the thing public, and brought it into use, and he is undoubtedly the person entitled to the reward of a monopoly for so doing, even if it be admitted that the statements of those who came forward with their evidence of thirty years old, is always free from suspicion but which I think is never so.

In this particular then, I am of opinion, that the patent law, requires to be *altered,* and there are others in which great *improvements* might be made, for instance, some security should be given to inventors during the time which their patents are passing through the public offices and which I have known to be six months: they commit their secret to the public in some measure, in the first step taken to obtain a patent, by the little they give to it, and then they are left at the mercy of chance discovery, or designing intrigue, till the Seal is affixed to their patent; this is obviated in France, by giving a receipt for the petition which is first presented for the patent, and then letting the patent bear even date with that receipt, however long afterwards it may be granted, and I cannot see any reason why in this country, a similar plan should not be adopted. Another crying evil in the present form of letters patent, is the clumsy clause restricting the granting of licences to more than five persons. It is well known that the intention of this clause, was to limit the number of persons contained in any *one* licence to five, but from the form of words adopted, I do not hesitate to say, that all patents under which more than five licences, or a single licence to more than five persons, has been granted is voidable, though since the repeal of part of the Bubble Act, it seems but common sense, that this restriction should be removed in toto.

It is true that this clause, and, in fact, various other of the provisions in the patent grant, are in the discretion of the attorney and solicitor general for the time being; but so little is the mode of granting letters patent generally understood, that Mr. Maberly, in the plenitude of his information on the subject, stated in a committee of the House of Commons, a few days ago, that such was not the case, and that, too, when he was assuming to legislate as a member of the House on the subject of a patent bill.

Now the fact is too well known to every body who knows any thing about the subject to admit of a question, and is often acted upon; for sometimes, the attorney-general inserts a clause, reserving to the government the use of the invention, and sometimes omits it; and sometimes he will extend the time of enrolling the specification or application, and showing good cause for so doing, as in cases of getting inventions or documents over from India. And it was only when the present Lord Chancellor was Attorney-General, that in consequence of the part repeal of the Bubble Act, he materially shortened the wording of the clause, restricting the quantity of licences to more than five persons. Yet all this is so little known to the public that it was even publicly denied in a committee of the House of Commons, as I have before stated, not three weeks ago.

I am of opinion that a great evil results from the time given for the enrollment of specifications, being various; for it often happens that A takes out a patent in June, and has till December to specify, and B takes out a patent in July, and is obliged to specify in September, so that if A be a dishonest man, he may claim B's invention as his own as soon as it is specified, and his patent bearing date before B, he may, in December, specify the same thing as his own.

This requires a remedy of some sort, and, in fact, the defects of the present system are so numerous, that nothing but Parliamentary enquiry can search into them all, or would be likely to find a satisfactory remedy for each; and I do most earnestly hope, that the subject which has already excited some feeling in Parliament may not be suffered to drop; but that those most interested in mechanics, and best known to the public, will unite their forces on this very important subject, and not forget, because patents are daily taken out for the most absurd inventions, that the great mine of wealth which has fostered this country for years, namely, the steam engine, was in its practical origin, at least the subject of a patent; and that there is no greater stimulus to invention than a judicious system of such monopolies, which has the sanction of age in this country, and of adoption in almost every other, whether of the old or new world.

I trust these observations may be useful with respect to the great object I have alluded to, and

am, Sir, Your obedient servant,
BENJAMIN ROTCH.

1, Furnival's Inn, London,
27th June, 1827.

Novel Inventions.

Burstal and Hill's Steam Carriage.

A variety of inventions for conducting goods and passengers, by means of steam on ordinary roads, have been presented to the public during the last two or three years; but hitherto those projects have either failed altogether, or have not been pursued with sufficient energy to prove their capability of performing the business for which they were designed: at least, none have yet been produced in a perfect and efficient state.

The invention of Burstal and Hill, for this purpose, we described in our XIIth Volume, page 294, and there stated, that some further improvements had been made, for which the inventors were about to obtain another patent; these improvements, we understand, are now complete; and the specification being inrolled, we intend to give it in our next.

The improved steam carriage has, we understand, been brought to London; and so well satisfied are the inventors of its performance, that they have engaged a plot of ground, in St. George's Fields, near the Obelisk, and inclosed it, for the purpose of making a public exhibition, which is to open in the course of about a week. The merits of the invention will, therefore, be fully developed; and if the carriage can be propelled with a tolerable speed, upon the temporary road which is making, and that speed be kept up, there will remain no doubt, but that upon a good straight road the carriage will be found perfectly effective.

We have been informed, but do not vouch for the fact, that this carriage has ascended a road rising one foot in fourteen, which is certainly a very considerable ascent. If, therefore, a sufficient supply of steam can be produced, and the parts of the mechanism are not very complicated, or liable to derangement, which we are induced to believe is the [case, there is very little doubt but that we shall shortly be gratified with the sight of steam carriages upon the public highways.

In our next we hope to describe this machine, with our own remarks upon its merits and claims on public attention.

Perkins's New Steam Engine.

We have the pleasure of announcing, that Mr. Perkins has at length in a very satisfactory manner prooved the superiority of his newly constructed high pressure steam engine, by working it against two other steam engines upon the low pressure principle.

This small engine, which we have several times mentioned in our present volume, has been within these few days, set up at St. Catherine's Dock, and employed in pumping water from the excavation. There have been four steam engines engaged in the prosecution of these works, two for excavation, and two for pumping out the water. Mr. Perkins's engine stands along side a low pressure engine, of sixteen horse power, which is determined by the area of its piston.

The diameter of the piston, that is, the bore of the steam cylinder of the new high pressure safety engine, is eight inches, and its stroke twenty inches. It was connected by gear to a beam that made sixteen vibrations per minute, and raised two alternating pump buckets, the diameters of which are fourteen inches, and their strokes three feet three inches.

We were extremely anxious to communicate our observations on the effect and action of this engine, but the first time of its working can hardly be considered to be a fair criterion of its capability. We understand that it is expected to perform twenty strokes per minute, and will then it is said, lift 900 gallons of water every minute. Our limits will not allow us to say more upon this subject at present, but we intend to take a more deliberate view of the engine in a few days, when it gets fully into action; we think it important, however, to subjoin the following certificates, which speak for themselves, and require no comment from us.

"We, the undersigned, certify, that there are two low pressure steam engines, employed night and day in discharging the water which flows into St. Catherine's Dock, from the land-springs, &c.; that one of them is a sixteen and the other a ten horse engine. We also certify, that Mr. Perkins has recently put up a small high pressure steam engine, the diameter of whose piston is eight inches, its stroke twenty inches; and that we have seen this engine pump the same quantity of water from the Docks which has been heretofore pumped by the other two."

JAMES LAMON,
PEARSON WOODWARD,
THOMAS BROWNE.

"I, the undersigned, certify that I have superintended and put up Mr. Perkins's high pressure safety engine. I also certify that what is stated by the above engineers is true, and that it was done with only 42 lbs. of coal per hour. Having been engaged twenty two years in making and putting up engines, principally in Cornwall, it is not likely that I could be deceived as to the power and efficacy of this engine; and I consciously believe, that two thirds of the coals used in this country might be saved by the use of this engine."

HENRY HORNBLOWER,

"I, the undersigned, carefully weighed the coals and placed them under Mr. Perkins's generator: that 42lbs. wt. of coals only, was used per hour. I also certify that what is stated by the above engineer respecting the work done, is true."

W. HERNE.

Mr. Perkins is of opinion that the two low pressure engines could not have been worked up to their full power, although they used the full quantity of coal, three and a quarter bushels per hour; but admitting they worked at only two thirds of the power, there would be a saving of about three fourths of the coal consumed in low pressure engines, by the employment of Mr. Perkins' new principle.

Tunnel under the Thames.

The accidental influx of water, which has interrupted the progress of this work, however much to be regretted, has never been considered by us, as any otherwise serious than in delaying the completion of this great undertaking, and increasing its expences.

The very great anxiety felt by the public in every part of the empire upon this subject, has induced us to visit the works at the latest hour previous to publication, and to collect such information as may be relied on. We have by favour of Mr. Brunel, been admitted to the interior of the tunnel, from which nearly all the water has now been withdrawn; at least it has been, so far pumped out as to leave a considerable portion of the road-way at bottom dry. The masonry and brick-work in every part appears to be sound, and not to have experienced the slightest injury from the water which was within. The hole in the bed of the river through which the water forced itself into the tunnel, at the end where the excavators were at work, has been closed, but the surrounding ground is so loose, and soft, that a considerable quantity of water still flows into the tunnel, at the part which is unguarded by the masonry, and the pumps are constantly at work to keep it from accumulating.

A great variety of plans have been proposed by different individuals, to stop the filtration of the water through the loose parts of the bed of the river. Mr. Brunel has, however, had recourse to that which was suggested in the first instance; viz. after filling the hole with clay, to spread tarpaulings over that part of the bed of the river, and to deposit a very considerable quantity of clay and gravel upon these tarpaulings, which, it is expected will prevent the water from filtering through the loose earth in future, and from a solid false bottom to that part of the river.

As soon as the bedding has been completely laid, which will occupy only a few days, and it is perceived that very little, if any water finds its way into the tunnel, through the bed of the river, the excavators will resume their operations, and it is expected that the business will proceed without further impediment.

The report which Mr. Brunel presented at a public meeting a few days ago, to the directors and proprietors of the tunnel is so satisfactory, and full of information that we cannot refrain from presenting it to our readers, through the substance of it has already found its way into some of the public prints.

The CHAIRMAN explained the object of the meeting, which had been convened to receive a report from the engineer and directors on the state of the works generally. The directors, he said, were prepared to submit every, the most minute, particular of the accident which had befallen the works—works which had been undertaken under the most auspicious circumstances, and stopped by an accident that might have been foreseen, but could not have been prevented.

The SECRETARY then read Mr. Brunel's report to the directors as follows:—

"Gentlemen—In compliance with the request of the directors to report to them the circumstances connected with the late irruption of the Thames, the present state of the works, and the future prospect of success in the completion of the Tunnel, I beg leave to lay before them the following report:—Previous to my proceeding to detail the immediate causes of the late irruption, it may be proper for me to advert to the events which occurred in the progress of the works, with reference to the nature of the soil. In consequence of the extremely bad state of the ground, towards the end of March last, I deemed it proper to report thereon to the directors, and lay before them specimens of the strata. Considering it also important to obtain all the information I could, I thought it necessary soon after to apply to Mr. Rennie for a diving bell, which, through the liberality of the directors of the West India Docks, and the civility of Captain Parish, I obtained. After this application, and before the diving bell arrived at the works, the Easter holidays intervened, which occasioned a suspension of the works, and increased my apprehensions about the state of the ground. Before I examined the bed of the river myself, on the 22d of April, by means of the bell, the ground before us was found extremely soft from infilterations, and the stratum of clay was so thin as to be liable to depression and fracture by the running of the silt below it, The resumption of the works, however, after the holidays, being conducted with the greatest precaution, no accident occurred, but still the water was an incessant cause of delay. The frequent descent of bones, pieces of earthenware, brickbats, coals, &c. indicated the looseness of the ground, and also the precautions that were necessary to work it, which obliged my son and the assistant engineers to be more vigilant than ever, and to be on duty night and day. After the bed of the river had been examined by means of the diving bell, a circumstance occurred, which will convince every one of the extremely loose and dangerous nature of the ground which we had to work our way through. A shovel, which had been used in the diving bell, and left at the bottom of the river descended to the front of our shield, where it was found, and removed by my second assistant, Mr. GRAVATT, on the 12th. These circumstances proved, that the bed of the river had at this time made its way to us, and that the ground above us was in motion to a great extent; yet, notwithstanding this, the shield enabled us to advance through all these obstacles, the miners and bricklayers continuing to evince the utmost confidence in the protection it afforded them. I must say, therefore, that for about a month we were exposed to such difficulties as these, and that the shield alone enabled us to overcome them. It will be recollected that at the end of April and commencement of May, a further suspension of the works of eight days' duration took place, on account of a dispute with the men respecting their wages. This suspension had been attended with much greater difficulties and danger than we had hitherto experienced, most particularly during the night of the 12th, when the ground over the greatest part of the shield was, as it were, in the state of thick mud, forcing its way in many points at the same time. By about the 16th, however, we reached within a few feet of a stratum of clay, which we knew to be immediately a-head of us. Having thus stated the occurrences which preceeded the influx of the River on the 18th of May, I now proceed to the circumstances attending the irruption. This took place on the evening of the 18th ult. On the succeeding morning I descended in the diving bell, and examined the bed of the river. I discovered a spacious cavity over the spot, at the bottom of which cavity a smaller hole was found, where the irruption had taken place into the tunnel through a small space between the shield and the brickwork, the cause of which cannot be fully ascertained before we re-enter the tunnel. Borings were made at two different times across the river with the greatest accuracy, and soundings were taken by a Gentleman of eminence; and, in neither case were we led to expect that we were on this spot in any greater danger than we had already encountered and overcome. An examination of the bed of the river was made also with the diving-bell, which, nevertheless, led to the suggestion of no plan, to my mind, by which we could have improved our situation from the top. It is a probable surmise that this spot has been a dredging hole and, in that case it will explain the cause of the absence of gravel, which had hitherto always proved a check to an irruption of the river. I, however, do not possess sufficient knowledge to speak with any certainty upon this subject; but the recommencement of the work will enable me to obtain much information on this point. I now proceed to state the remedies that I have adopted to restore the works and the future prospect of success of the completion of the tunnel. In applying these remedies, I have kept in view the state of the finances of the Company, and have resorted to the least expensive mode. Clay, bags of clay and gravel properly disposed, are the means I have hitherto used in order to close the opening. I have already succeeded in closing the hole through which the water first penerated; aud feel confident that the second hole, which afterwards appeared, is also stopped; but a short time is necessary to elapse for the new ground over the shield to settle and consolidate. It has already supported a head of water of thirty five feet. In the future progress of the works I have every well-founded confidence that I shall be able to complete the remaining part of the tunnel, but should I meet with greater difficulties than those lately experienced, and should the simple, and in my opinion, the efficacious means which I have resorted to, not be sufficient to overcome these difficulties, still there are ample resources upon which I can rely; for, in an engineering point of view, no insurmountable difficulties present themselves.—I have the honour, to be, Gentlemen, your most obedient humble servant," "MR. J. BRUNEL."

"P. S. I have not mentioned the raft among the remedies I have employed, because, I have already stated to the Directors, 'it is not, and never was, intended to stop the water, but it is made for protecting the new made ground against any sudden displacement when the men re-enter the works.'"

Both these reports were received, and after some conversation, the Meeting adjourned.

We cannot close our notice of the Thames Tunnel, without observing that it is our firm conviction, nothing but the want of pecuniary means is likely to prevent the completion of this great work, and we anxiously hope, and trust for the honour of our country, that public spirit, and real patriotism will promptly come forward, and voluntarily lend their pecuniary aid to assist, and support the exertions of the directors, whose funds must be considerably weakened, and indeed we fear, will be exhausted before the work can be finished.

For our part our mite of assistance shall be cheerfully contributed as soon as any organized plan can be formed for carrying the intention into effect, and we earnestly recommend it to public attention.

Polytechnic and Scientific Intelligence.

SOCIETY OF ARTS.

The Rewards adjudged by the Society during the Session 1826-7, *presented to the respective Candidates, by* HIS ROYAL HIGHNESS THE DUKE OF SUSSEX, *President*, 4*th JUNE*, 1827:

IN AGRICULTURE.

To P. Green, Esq. Crookham, Berks; for his waggon for conveying live lambs to market, the Silver Ceres Medal.

To Mr. W. Thorold, Great Melton, Norfolk, for his machine for slicing turnips, the Silver Ceres Medal.

To W. Withers, jun. Esq. Holt, Norfolk, for his experiments on the effect of manure on young plantations of forest trees, the large Silver Medal.

To W. Long, Esq. Preshaw House, near Alton, Hants, for planting 195 acres with forest trees, the Gold Ceres Medal.

To C. C. Western, Esq. MP. Felix Hall, Kelvedon, Essex, for his long Anglo-merino wool, the Gold Ceres Medal.

To Mr. C. Poppy, jun. Witnesham, near Ipswich, for his method of protecting turnips from the fly, the Gold Ceres Medal.

IN MECHANICS.

To Mr. W. J. Hood, Lieut. R.N. H.M.S. Hyperion, for his Ice saw, the large Silver Medal.

To Mr. Jos. Hillman, Master Shipwright's Assistant, Royal Dock Yard, Deptford, for his sliding rudder, the large Silver Medal.

To Mr. J. Weekes, Master Shipwright's Assistant, Royal Dock Yard, Chatham, for his mode of securing the dead eyes of a ship, the large Silver Medal.

To Mr. James Hookey, Midshipman, RN. for his improved ship's log, the large Silver Medal.

To Mr. Bothway, Gunner, R. N. Devonport; for his improved cat-block, the Silver Vulcan Medal.

To Mr. J. B. Kooystra, Lieut. R.N. for his mode of securing the stopper of a chain cable, the Silver Vulcan Medal.

To J. Hawks, Esq. Upper Thames-street, for his revolving light for steam boats, the large Silver Medal.

To R. Cowen, Esq. Carlisle, for his syphon for draining stone quarries, &c. the Gold Vulcan Medal.

To Mr. J. P. Paine, High-street, Bloomsbury, for his mode of illuminating public clocks, the large Silver Medal.

To Mr. G. Smart, Broadstairs, Kent, for his wrought iron trussed girder, the Silver Vulcan Medal.

To Mr. W. H. Perkins, Stanstead, Herts. for his improved cap for a malt kiln, the large Silver Medal.

To W. J. Charlton, Esq. War Office, for his closet for papers, the Silver Vulcan Medal.

To W. Caffin, Esq. Woolwich Common, for his instrument for filling cartridges and measuring wheat, seeds, &c. the large Silver Medal.

To Mr. Jonas Thurrell, Little King-street, Camden Town, for his improved mangle £5.

To Mr. Ad. Reid, Woolwich, for his compensation pendulum £5.

To Mr. W. Burn, Kirby-street, Hatton Garden, for his rolling press for book-binders, the Silver Vulcan Medal.

To Mr. G. Machin, Wolverhampton, for his expanding key for a lock, the Silver Vulcan Medal.

To Mr. J. Bower, Clerkenwell Green, for his improved lathe chuck, the large Silver Medal.

To Mr. J. Packham, Maidstone, for his self-adjusting truss, the Silver Vulcan Medal.

To Mr. Geo. Gibson, Crescent, Birmingham, for his types for the use of the blind, the Gold Vulcan Medal.

To Don Jaime Isern, for his instrument to enable the blind to write music, the large Silver Medal.

To Mr. W. Thorold, Melton, near Wymondham, for his reel to Capt. Manby's apparatus, the Silver Vulcan Medal.

To Mr. J. Callaghan, Carlisle-lane, Lambeth, for his face-guard for smelters, &c. £5 5s.

IN POLITE ARTS.—(*Class of Nobility.*)

To Miss Cockburn, St. John's grove, Regent's Park, for an original portrait in water-colours, the large Silver Medal.

To the Hon. Miss Forester, for a copy of figures in water-colours, the Silver Isis Medal.

To Miss Long, Montague-square, for a copy in pencil of a landscape, the Silver Palette.

To the Hon. Miss C. Turnour, Rose Cottage, Regent's Park, for a copy in water colours of flowers, the Silver Palette.

(*Honorary Class*)—*Copies.*

To Mr. J. Bizo, White Rose Court, Coleman-street, for a drawing in Indian ink of a head, the Silver Isis Medal.

To Master H. Crockford, Sussex-place, Regent's Park, for a drawing in pencil of a landscape, the Silver Palette.

To Miss Du Pasquier, St. James's Palace, for a drawing in chalk of a head, the Silver Palette.

To Miss E. Blair, Welbeck-street, for a drawing in chalk of a head, the Silver Palette.

To Miss S. C. Musters, Miss Appleton's, Upper Portland-place, for a drawing in chalk of a head, the Silver Isis Medal.

To Miss A. Redaway, Strand, for a drawing in pencil of a landscape, the Silver Palatte.

To Miss S. Field, Grove Lodge, Lower Tooting, for a drawing in pencil of figures, the large Silver Medal.

To Miss M. A. Pillochody de Bavoy, South Crescent, Bedford-square, for a drawing in water colours of a landscape, the Silver Isis Medal.

To Miss C. Walker, Blythe Hall, Bawtry, for a drawing in water colours of a landscape, the Silver Palette.

To Miss J. W. Hurlstone, Sloane-street, for a drawing in water colours of flowers, the Silver Isis Medal.

Drawings from Busts and Statues.

To Mr. J. Reeve, Brunswick-street, Blackfriars, for a finished drawing in chalk from a statue, the Silver Isis Medal.

To Miss H. Salmon, Piccadilly, for a drawing in chalk from a bust, the large Silver Medal.

Original.

To Miss F. Corbaux, Hercules Buildings, Lambeth, for a portrait in miniature, the large Silver Medal.

To Miss Mintorn, Woodfield Cottage, Bristol, for a composition in water colours of fruit and flowers, the Gold Isis Medal.

To Miss C. Depree, Mecklenburg-street, for a drawing in water colours of a flower, the large Silver Medal.

To Miss Manning, Norbury Priory, Leatherhead, for an historical composition in oil, the Gold Isis Medal.

(*Artists' Class*)—*Copies.*

To Mr. George Stodart, Strand, for a drawing in indian ink of a figure, the Silver Isis Medal.

To Miss E. Setchell, King-street, Covent Garden, for a drawing in chalk of a head, the Silver Palette.

To Mr. H. Abbott, Southampton-street, Strand, for a drawing in Indian ink of heads, the Silver Palette.

To Mr. T. Pitts, Savoy-street, Strand, for a drawing in chalk of a head, the Silver Palette.

To Mr. J. Slade, Hatton Garden, for a drawing in pencil of a landscape, the Silver Isis Medal.

To Mr. A Arnald, Weston-street, Pentonville, for a drawing in chalk of animals, the Silver Palette.

To Mr. W. A. Crabb, Point Pleasant, Wandsworth, for a drawing in water colours of flowers, the Silver Palette.

To Mr. S. Collins, Cockspur-street, for a portrait in oil, the Silver Isis Medal.

To Miss Alabaster, Half-moon-street, Piccadilly, for a portrait in oil, the large Silver Medal.

Drawings from Busts and Statues.

To Mr. J. S. Fennell, Webb's County Terrace, Kent Road, for a finished drawing in chalk from a statue, the large Silver Medal.

To M. M. M. Hart, Gerrard-street, Soho, for an outline in chalk of an entire anatomical figure, the Silver Isis Medal.

To Miss C. Derby, Osnaburg-street, New Road, for a drawing in chalk from a bust, the Silver Isis Medal.

Original.

To Mr. C. R. Bone, Charlotte-street, Portland-place, for a portrait in miniature, the large Silver Medal.

To Miss M. Jones, Coleman-street, for a portrait in miniature, the Silver Isis Medal.

To Mr. B. R. Green, South Crescent, Bedford-square, for a portrait in oil, the Silver Isis Medal.

To Miss H. Kearsley, Rathbone-place, for a portrait in oil, the large Silver Medal.

To Mr. Al. Bower, Charlotte-street, Bloomsbury, for a portrait in oil, the Gold Isis Medal.

To Mr. Fr. Lines, Birmingham, for a drawing in pencil of a landscape, the large Silver Medal.

To Mr. Edward Stow, King-street, Portman-square, for a landscape in oil, the large Silver Medal.

To Mr. R. Clarke, Gloucester Terrace, Vauxhall Road, for a marine painting in oil, the Gold Isis Medal.

To Mr. James Walsh, Worton House, Isleworth, for a composition in water colours of flowers, the large Silver Medal.

To Mr. T. Brigstoke, Charlotte-street, Bloomsbury, for a painting in oil of still life, the Silver Isis Medal.

To Miss A. Gwenap, Upper Belgrave-place, Pimlico, for a composition in water colours of fruit, the Silver Isis Medal.

To Mr. H. Bielfield, Tottenham-court road, for a design for the Society's vignette, the large Silver Medal.

Models.

To Mr. R. Webb, Charles-street, Middlesex Hospital, for a copy in bas relief of an entire figure, the Silver Isis Medal.

To Mr. E. Papworth, Caroline-street, Bedford-square, for a copy in bas relief of an entire figure, the Silver Palette.

To Mr. J. Mason, Twickenham, for a copy of a bust from the antique, the Silver Isis Medal.

To Mr. W. Wooles, High Holborn, for an original model of an historical group, the large Gold Medal.

To Mr. H. Bailes, Oxford-street, for a copy of a figure carved in wood, the Silver Isis Medal.

Architecture.

To Mr. T. Atkinson, Upper Stamford-street, for an original composition of architectural ornaments, the large Silver Medal.

To Mr. S. Loate, Edward-square, Kensington, for an original design for a metropolitan university, the Gold Isis Medal.

To Mr. J. D. Paine, High-street, Bloomsbury, for an original design for a court of justice, the large Silver Medal.

Drawings of Machinery.

To Mr. G. H. Phipps, Alfred Place, Great Surrey-street, for a perspective drawing of a steam engine, the large Silver Medal.

To Mr. W. H. Barlow, Rush Grove Cottage, Woolwich, for a perspective drawing of a crane, the Silver Isis Medal.

Etchings and Engravings.

To Mr. J. B. Forrest, Dean-street, Soho, for a finished engraving of a portrait, the Silver Isis Medal.

To Mr. R. Parr, Southampton Place, Euston-square, for an etching of animals, the large Silver Medal.

To Mr. James Eke, Clarendon-square, Somers' Town, for an engraving on steel of a cotton machine, the Silver Isis Medal.

Gem Engraving.

To Mr. W. Warner, New North-street, Red Lion-square, for an engraving in itanglio of a group, the Gold Isis Medal.

Anatomical Models.

To Mr. Joseph Towne, High-street, Borough, for a model in coloured wax of the human brain, the large Gold Medal.

IN CHEMISTRY.

To Mr. G. Field, Syon Hill Park, Isleworth, for his colourless lac varnish, £20.

To Mr. H. Luning, Apothecaries' Hall, for his colourless lac varnish, £20.

To Mr. C. Cameron, Glasgow, for his soda ley for the use of dyers, £5 5s.

The Thanks of the Society have been voted to the Following Gentlemen, and their respective communications have been directed to be inserted in the next Volume of the Society's Transactions.

To Capt. T. M. Bagnold, for his mode of preparing lime juice.

To J. Houlton, Esq. Grove Place, Lisson Grove, for his mode of preparing vegetable extracts.

IN MANUFACTURES.

To Messrs. J. and A. Muir, Greenock, for their hats of British Leghorn, £21.

To the same, for their fine plat, £10 10s.

To Mr. Jos. Long, Claydon, Suffolk, for fine plat from British materials, £5 5s.

To Mr. J. James, James'-street, Lambeth, for his mode of opening horn, the Silver Vulcan Medal, and £5 5s.

IN COLONIES AND TRADE.

To Fr. Collison, Esq. Cape of Good Hope, for cape wine of superior quality, the large Gold Medal.

The following Candidates in Polite Arts have had Medals awarded to them, but by the Rules of the Society, are precluded from receiving them, having already had equal or superior rewards in the same departments of Art.

Mr. W. Smith, John Street, Crutched Friars.
Mr. D. Pasmore, Salisbury-court, Fleet Street.
Mr. T. Hughes, Long Acre.

☞ Since the last Distribution, 70 new Members have been elected.

A List of Patents

GRANTED BY THE FRENCH GOVERNMENT FROM THE 1st OF JANUARY, TO THE 31st OF MARCH, 1827.

To M. Calla, Engineer, Paris, for a new kind of corner stone, or boundary.—5 years.

— M. de Bourgoing, Paris, for the invention of a new reproductive art, called *Lithophanie* applicable to every combination of opague and transparent bodies.—15 years.

— Labbaye, Jaques Michel, Paris, for an harmonic trumpet with three ventilators and plug keys.—5 years.

— Clairembourg, Nicholas Louis, Rouen, for the invention of a liquid paste, for sharpening razors, and softening leather of all descriptions.—5 years.

— Risler, Brothers and Dixon, of Cernay, for the invention of a loom for weaving cotton, wool, flax and silk, &c.—5 years.

— Carillon Romain Desire, Paris, for a steam-engine, with an inclined piston, stop, partial condenser, and metallic apparatus.—5 years.

— Brasseux, junior, Hippolyte, Paris, for a seal with 100 mottos, called the *Cachet Medailler.*—5 years.

— Messrs. Duret, Antoine and Anthoine, junior, Pierre Thomas) of Paris, for a method of paving ovens, by means of the free stone, vulgarly called *Pierre de Barbantine.* —5 years.

— Chaussenot, Bernaud, Paris, for an apparatus of lighting up by means of *hydrogen gas percarbure,* obtained from a distillation of resin, and other matters, liquid as well as solid.—10 years.

— Boulet, Jaques Paris, for a preparation to be used in carding and combing wool, in order to lay the fibres straight.—15 years

— Madam Widow Susse, (of the family of Aglae Reine Aube,) Paris, for a cylinder for stamping and marking drawings, borders and figures upon skins, and leather of all kinds.—10 years.

— Beauvais, Camille, and D'Antremont, M. Paris, for a silk and woollen dressing machine.—7 years.

— Haize, Felix and Binet, Pierre Jaques, Paris, for a safety valve for steam engines.—5 years.

— Derheims, Charles Francois, Lyons, for a particular method of constructing steam boats, in shallow rivers, as well as in deep waters.—5 years.

— Mairet, Francois Ambroise of Fouteney, for a paper making machine to any dimensions.—5 years.

— Piquet, Jean Nautes, for a machine called a Polymetre, for for giving the dimensions os different figures.—5 years.

— Ansman, Paris, for a comb with several rows of teeth, and a handle.—5 years.

— Vanboorick, Silvestre, Strasbourg for a carriage which by means of a moveable beam cannot be overturned.—10 years.

To Castereau, Pierre, Paris, for a lengthening table, by means of joints instead of slides.—5 years.

— Berthault, Claude Jean Baptiste Alexandre Chalous sur Saine, for an impermeable mastich.—15 years.

— Guimberteaux, Pierre Louis Paris, for a machine called a *Corbeau*, for carrying off or letting down any kind of materials. —5 years.

— Roteh, Benjamin, Paris, for a machine for winding silk.—15 years.

— Erard, Sebastien Paris, for a machinery adapted to pianos, and other improvements.—15 years.

— Tereygeol, Jean Baptiste Paris, for the construction of a mill without mill-stones, for grinding flour.—15 years.

— Rabier, Toachim Rennes, for a method of constructing wooden cylinders of all dimensions, adapted to the bellows of forges, and iron-foundries, and applications to vats, and many other uses.—10 years.

— Gensoul, Alexis Bruno Bagnolt, for a method of heating the pans used for winding off cotton balls, with economy of fuel.—10 years.

— Pocock, George Bristol, for a machine called the *Cerf-Volant*, used for drawing carriages, and lifting weights, and which may also be used in navigation.—10 years.

— Hoyeau, Louis Alexander Desire Paris, for a machine for making clasps.—15 years.

— Berard, Simon and Wilkinson, James for a bobbin and carriage, for spinning, stretching, and twisting silk, flax, hemp, wool, cotton, &c.—15 years.

— Dietz, Son, Paris, for an entirely new piano, of new construction and mechanism.—10 years.

— Gourlier, Adrien Jean Baptiste, Paris, for an iron rammer, called the *Fer Mobile, Cylindrique*.—5 years.

— Poucet, Claude Henri, Lyon, for a shuttle applicable to silks, &c. as well as cloth.—5 years.

— Nery, Paris, for an apparatus for preventing chimneys from smoking.—5 years.

— Nery, Honore Henri, Paris, for a steam engine, with improved rotatory movement.—10 years.

— Huet, Michel Laurent, Paris, for a bathing apparatus, with transportable vapour.—5 years.

— Tespaz, Pierre Paris, for an apparatus called the *Fumivore Vaporisateur Condensateur*, for condensing the vapour produced by the combustion of gas, oil, &c.—10 years.

— De Montaignac, Bordeaux, for improvements in the making and trying of iron chain cables.—5 years.

— Portefais, Brothers Paris, for a dynamic lamp.—5 years.

— Risler, Brothers and Dixon, Paris, for a new invented loom, called a *Mechoir*.—10 years.

— Newton, William London, for an apparatus called a *Calorifere and Refrigerant*, for heating and cooling fluids.—15 years.

To Miles, Berry, London, for improvements in the machines for dressing cloths, &c.— 15 years.

— Cave, Francois, Paris, for a machine with double-levers, to cut out and stamp malleable metals.—5 years.

— Godefroy, Devillers, and Co. Lille, for a bobbin and shuttle for spinning flax, and other filaments.—5 years.

— Finino, Jean Antoine, Paris, for a candlestick of bell-metal, with a driving bolt of one piece.—5 years.

— Clemencean, Francois Dourdan, for a machine for sifting wheat and grain.—10 years.

— Poucet, Onesime Guiltotiere, for improvements in the shuttles employed for figured silk stuffs.—10 years.

— Beauguillot, the Misses Josephine and Victoire, Caen, for an improved method of making the edge or ends of a piece of lace, &c.—5 years.

— Cunnigham, Charles London, for a machine for *making Pins' heads*.—10 years.

— Mengin, Marie Martin Philippe, and, Petit Jean, Alphonse Andre Francois, Paris, for machines for making small nails, called *Pointes de Paris*.—15 years.

— Carez, Joseph Toul, for a method of engraving in relief, called pantoglaphic.—15 years.

— Fichtenberg and Co. Paris, for various improvements in the fabrication of coloured paper, imitating granite, and marble, and for a method of glazing them.—10 years.

— Savaresse, and Co. Paris for a method of making harmonic cords without knots, and of one length for each instrument.—5 years.

— Duguet Son, Antoine Nicholas, Paris, for a machine called the *Petrin Mecanique* for kneading.—15 years.

— Lebrun, Tourpu Felix, Paris, for a machine for making lint from old linen, &c.—10 years.

— Carpentier Parfuit Modeste, Paris, for a mechanical bed and arm chair, with bandages.—15 years.

— Allien Auguste, Paris, for a liquid called *Marjolame*, for taking out grease spots.—5 years.

— Kettenhoven, Jean, Paris, for sandals composed of metal.—10 years.

— Cordier, Jean Marie, Beziers, for a process for extracting the oil, wine, or sugar from fruits by means of circular plates, and an hydraulic machine for presses.—5 years.

— Dillemann, Christophe, Francois and Martin, and Remhard Jean Michel, Strasbourg, for inventing a horizontal movement, and vertical pressure upon bobbins, for cotton spinning.—10 years.

— Caplain Senior and Junior, Petit Comoune and Elbeuf, for a machine for making brads.—5 years.

To Bonillon, junior Pierre, Limoges, for steam vessels without or with condensers, of all pressures and expansion.—10 years.

— Houlet, Dominique Marie, and Riverin, Silvain, Paris, for a method of employing spare bits of whalebone, in making buttons of all colours.—5 years.

— Blard, Laurent, Paris, for a machine for stamping and closing at the same time the slides and rings called *bellieres*, used in chains for reticules, watches, &c.—5 years.

— Junin, Anthelme, Paris, for a method of making diamond cut, washed and gilt headed nails.—5 years.

— Poucet, Claude Henri, Lyon, for a shuttle for weaving stuffs and cloths.—5 years.

— Rule Charles, Paris, for a method of extracting gas from oily, resinous, or bittummous substances, with great economy and expedition.—15 years.

— Meugin, and Petit Jean, Montalaire, for machines for making brads, called *Pointes Depans*.—15 years.

— Chauvelot Jean Baptiste, Dijon, for a machine for sifting corn, removing the shoots from malt, and which, with a little alteration, may be used also as a bolting machine.—5 years.

— Fischer, Son Jean Conrad, Paris, for a kind of steel, called a *Acier Meteorique*.—15 years.

— Hutter Jean Thomas, Lyon, for a mechanical oven, for glass works.—5 years.

To Cote, Charles, Lyon, for a piano with keys placed in the cords, and for improvements in the trimming of the hammers in all kinds of pianos.—5 years.

— Pilot, Duhelles Jaques, Jean, and Kenever, Louis, Morlaix, for a method of making common and hydraulic lime of great strength.—10 years.

— Lepine, Paris, for a gas generating lamp called a *gaza-lampe*.—10 years.

— Furnival, William, of Ashton, for a new apparatus for making salt, which may be removed from place to place.—15 years,

— Galy, Cazalat Antoine, Paris, for a percussion gun and its charge.—10 years.

— Fortier, Paris, for a cast iron stove, for the circulation of warm air.—5 years.

— Allard, Jean Joseph, for a self-supplying lamp.—10 years.

— Devillez, Bodson and Son, Bazeilles, for a machine for making handles for frying pans.—10 years.

— Galy, Cazalat Antoine, and Dubain, Jules Joseph, Paris, for the invention of a propelling power, acting without machinery to take the place of steam in trading vessels, and insubmersible fire ships.—10 years.

— Ledoux, Engine Valentia, and Herhan, Louis Etienne, Paris, for a new invented mould for casting types, and a machine for making grooves applicable to casting.—15 years.

New Patents Sealed, 1827.

To William John Hobson Hood, of Arundle-street, Strand, in the county of Middlesex, lieutenant in our Royal Navy, for his invention of certain improvements on pumps, or machinery for raising or forcing water, chiefly applicable to ships—Sealed 26th May—6 months.

To George Burges, of Bagnigge Wells, in the county of Middlesex, gent., for his invention of certain improvements in the construction of wheeled carriages, and wheels to be attached to the said carriages, or for other purposes—26th May—6 months.

To Thomas Clarke, of Market Harborough, in the county of Leicester, carpet and worsted manufacturer, for his invention of certain improvements in manufacturing carpets—26th May—4 months.

To Malcolm Muir, of the city of Glasgow, for his invention of certain machinery for preparing boards for flooring and other similar purposes—1st June—2 months.

To John Were Clark, of Tiverton, in the county of Devon, for his invention of an improved mode of attaching fixing, or securing the dead eyes to the channels and sides of ships or vessels—8th June—6 months.

To Joseph Cliseld Daniell, of Stoke, in the county of Wilts, Clothier, for his invention of certain improvements in preparing wire cards, and dressing woollen and other cloths—8th June—6 months.

To Charles Phillips, esq. of Rochester, in the county of Kent, captain in our Royal Navy, for his invention of certain improvements on capstans—8th June—6 months.

To Hugh Evans, of Great Surrey-street, in the county of Surrey, lieutenant in our Royal Marine Corps, and William Robert Hale King, of Snow-hill, in the city of London, tin-plate worker, for their invention of a new table apparatus to promote the ease, comfort, and economy of persons at sea, or on nautical excursions—12th June—6 months.

To Thomas Don, of Lower James-street, Golden-square, in the parish of St. James's, in the city of Westminster, millwright, and Andrew Smith, of Wells-street, Oxford-street, in the parish of Mary-le-bone, in the county of Middlesex, builder, for their invention and discovery of methods of making and constructing shutters and blinds of iron or steel, or any other metals or compositions thereof, and improved methods of constructing and fixing shutters and blinds of iron or steel, or any other metals or materials, and methods of uniting in shutters the double properties of shutters and blinds—15th June—2 months.

To Solomon Robinson, of Leeds, in the county of York flax-dresser, for his invention of improvements, in machinery for hackling or dressing and clearing hemp, flax, and tow—16th June—6 months.

To Lambert Dexter, of King's Arms-yard, Coleman-street, in the city of London, esq. in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements in machinery for the purpose of spinning wool, cotton, and other fibrous substances—16th June—6 months.

CELESTIAL PHENOMENA, FOR JULY 1827.

D.	H.	M.	S.	
1	19	8	0	☽ in □ first quarter.
2	8	0	0	☽ in conj. with ι in Taurus
2	16	0	0	☽ in conj. with α in Virgo.
3	16	0	0	☽ in conj. with λ in Virgo.
4	5	0	0	☽ in conj. with 2 α in Libra.
5	1	0	0	☿ in conj. with δ in Cancer.
5	0	0	0	Clock before the ☉ 4′ 2″
5	1	0	0	☽ in conj. with κ in Libra.
5	6	0	0	☽ in conj. with λ in Libra.
5	11	0	0	☽ in conj. with 1 β in Scorpio
5	11	0	0	☽ in conj. with 2 β in Scorpio
5	13	0	0	☽ in conj. with γ in Scorpio
6	15	0	0	☽ in conj. with ρ in Oph.
7	11	0	0	☽ in conj. with 2 μ in Sagitt
8	10	30	0	Ecliptic Opposition or ● Full Moon.
9	12	0	0	☾ in conj. with β in Capri.
14	9	0	0	☿ in conj. with ε in Pisces.
15	0	0	0	Clock before the ☉ 5′ 28″
15	8	35	0	☾ in □ last quarter.
16	0	0	0	☿ in conj. with η in Gemini.
17	13	0	0	☿ in conj. with μ in Gemini
19	0	0	0	♀ in conj. with ε in Taurus
20	0	0	0	Clock before the ☉ 5′ 55″
20	8	0	0	☾ in conj. with ζ in Taurus
21	9	0	0	☾ in conj. with γ in Gemini
23	5	13	0	☉ enters Leo.
23	12	44	0	Eclipt. conj. or ● New Mo.
24	9	0	0	☽ in conj. with 1 α in Cancer
24	10	0	0	☽ in conj. with 2 α in Cancer
24	20	0	0	♃ in conj. with γ in Virgo.
25	0	0	0	Clock before the ☉ 6′ 8″
25	8	0	0	☽ in conj. with ο in Leo.
25	15	0	0	♀ in conj. with ♄ long. 12′ in Cancer ♀ lat. 22° 53 N. ♄ lat. 22,24 N. diff. lat. 29′
25	17	0	0	☽ in conj. with π in Leo.
27	18	0	0	☽ in conj. with υ in Leo.
28	9	0	0	♀ in conj. with δ in Gemini
30	0	0	0	☿ Stationary.
30	0	0	0	Clock before the ☉ 6′ 6″
30	0	0	0	☽ in conj. with λ in Virgo.
31	2	59	0	☽ in □ first quarter
31	12	0	0	☽ in conj. with 2 α in Libra

The waxing ☽ moon—the waning moon ☾.

Rotherhithe. **J. LEWTHWAITE.**

METEOROLOGICAL JOURNAL FOR MAY AND JUNE, 1827.

1827.	Thermo.		Barometer.		Rain in inches.	1827.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
MAY						JUNE.					
26	63	44	29,40	29,30	,3	11	73	41	30,08	30,04	
27	57	41	29,53	29,46	,05	12	74	44	30,04	stat.	
28	67	51	29,70	29,57		13	76	46	30,04	29,95	
29	63	54	29,69	stat.		14	76	46	29,86	29,79	
30	69	44	29,78	29,76		15	70	61	29,69	stat.	
31	65	50	29,66	29,59	,025	16	67	55	29,63	stat.	,025
JUNE.						17	79	55	29,77	29,70	
1	65	46	29,70	29,60		18	73	55	29,85	29,84	,025
2	60	40	29,65	29,50	,05	19	69	51	29,85	29,80	,05
3	63	40	29,77	29,70	,1075	20	69	49	29,75	stat.	
4	63	43	29,80	29,78		21	62	42	29,80	29,78	
5	64	48	29,74	29,53		22	68	49	29,92	29,88	
6	63	48	29,68	29,53	,075	23	65	50	29,99	stat.	
7	60	43	29,92	29,86		24	68	39	30,00	29,99	
8	68	34	30,17	30,06	,075	25	66	49	30,00	stat.	
9	72	38	30,19	30,18							
10	72	46	30,19	30,14							

LOWER EDMONTON. **CHARLES H. ADAMS.**

Lat. 51° 37′ 32″ N. Long. 0° 3′ 51″ W. of Greenwich.

LITERARY AND SCIENTIFIC NOTICES.

A Prospectus has been issued for publishing, by subscription, a Series of Views, illustrative of the Scenery and Antiquities of Northern Africa; in the regions of Nubia, and the country above the Cataracts of the Nile, of Upper and Lower Egypt, the Cyrenaic Pentapolis, and the shores of the Greater Syrtis, the Views will be engraved from drawings made on the spots, by H. W. Beechy, Esq., during his travels in the above countries.

The Directors of the British Institution, have presented Hilton's painting of Christ Crucified, (at present in the exhibition of the Royal Academy, and for which they gave one thousand guineas,) to the New Church at Pimlico.

The new and spacious Museum for Antiquities, which has been in course of building for some considerable time past at Berlin, is expected to be finished next year. The collections that are to be placed in it will be greatly augmented by the purchase of Count Ingenheim's extensive gallery, the collection will contain some hundreds of splendid works, including a Torso of Adonis, a fragment of frieze from the Forum Trojan, and other valuable specimens.

Architecture. Mr. Robinson, whose works on architecture have gained him much celebrity, is engaged on a New Vitruvius Britannicus, to be published in numbers; the specimens of the Plates designed, for the forthcoming number, appears to be executed in a style of excellence deserving of commendation.

In the press, and shortly will be published, an Essay on the Effects of Climate in Diseases of the Lungs, Digestive Organs, &c., including directions to Invalids going abroad, respecting the best seasons and modes of travelling, the choice of residence, and the general management of their health. To which is added, some account of the principal mineral waters of the Continent, of their affects in chronic affections of the lungs, stomach, liver, bowels, uterine system, and skin. By James Clark, M.D.

Nearly ready for publication, a Series of Views in the Isle of Wight, illustrative of the scenery, castles, fortresses, and noblemen and gentlemen's seats, comprising also views of the coast, from drawings made during the last summer, by Mr. F. Calvert, under whose superintendance the Plates will be finished and coloured.

The invention, termed Lithontriptor, reported in this present number, and said in the English specification of Mr. Isaiah Lukin's, late of Philadelphia, to be an improvement on an instrument invented by M. Civiale, M.D. of Paris, seems to be the subject of great dispute by two or three individuals in France. M. Heurtelop claims the invention as his, and Dr. Fournier has asserted that he availed himself of such an instrument in public experiments at Paris, as early as the year 1817. But to leave the disputants, and turn to its usefulness, it appears from a memoir that M. Heurtelop presented to the Academie of Sciences, that of six patients, the treatment of whom he undertook, and who had all pretty large calculi, none experienced any serious inconvenience, and five of the six was completely freed from the stone.

Oriental Literature.—A fine edition of the curious Indian Drama, Sacontala, is in the press, edited by M. De Chézy. It will be accompanied by a translation in French, for the purpose of enabling persons, ignorant of Sanscrit, to form an idea of the Homeric genius of Indian literature. This edition has been undertaken at the expence of the Asiatic Society of Paris.

The French government are about to publish editions in the Persian language of Tabari, Ferdonsi, &c., as well as editions of the Chronicles of India and China.

Exhibitions have lately been made on the Waterloo Bridge, and other places in the neighbourhood of London, of a mode of impelling carriages upon roads by means of paper kites. Something of the same kind was attempted some years back, by the Rev. Mr. Cecil, of Cambridge, but with very little success; and we have no expectation that such a contrivance will ever turn out of any public use.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LXXXII.

Recent Patents.

To MAURICE DE IONGH, *of Warrington, in the County Palatine of Lancaster, Cotton Spinner, for his Invention of an Improvement or Improvements in Spinning Machines, and preparing Machines generally called Mules, Jennies, Slabbers; and any other Machines to which his Invention may be applied; whereby much labour hitherto done by hand is performed by Machinery.*

[Sealed 29th March, 1825.]

WE have several times had occasion to notice the efforts of ingenious mechanics to produce a combination of machinery capable of performing the various and difficult evolutions connected with the process of spinning and winding cotton and other fibrous substances, by the action of mechanical power unassisted by manual labour; that object, however, had never been fully accomplished and brought into successful operation, until the machine was perfected which constitutes the subject of the present patent.

From the diversity of talents which have been at different times engaged, for many years past, in the pursuit of this "Philosopher's Stone," a SELF SPINNING MULE, it would appear, that no ordinary genius was capable of effecting its accomplishment, indeed it has generally been considered as physically impossible. The completion therefore, of a system of mechanism which really does perform the operations of spinning and winding with the greatest accuracy and despatch, without the aid of mental and manual labour, must be admitted to be an achievement in mechanics, which reflects no inconsiderable degree of credit upon the inventive genius of the patentee.

There is a miſtaken policy prevailing in some minds which would suppress the cultivation of mechanical science, and depreciate every improvement in machinery which tends to the reduction of manual labour. If such erroneous views were to be countenanced and acted upon what should prevent us frcm returning to the practice of the barbarous ages, clothing ourselves in the skins of animals, and digging the earth with our finger nails?

But, the fact is, a nations wealth and prosperity invariably advances with the march of intellect, and the cultivation of science and the arts; and, while these improvements frequently produce partial and temporary evils, arising from the circumstantial changes in the distribution of human labour, by which its course becomes diverted from one channel to another, we should consider how great are the benefits we derive from the genius of an Arkwright, and a Watts, and remember that the same objections might have been, and probably were urged against their inventions as against that under consideration, viz. its tendency to reduce the demand for manual exertions in that particular branch of manufacture to which it belongs.

The self-spinning mule which we are about to describe performs the several operations of stretching or extending the fibres of the cotton or other material acted upon, spinning it into yarns, and winding it on to cops, by means of its internal mechanism. The uniform rotatory power of steam or water being applied as a first mover to the main axle of the machine, actuates the whole of the mechanism, and causes the same effects to result as would be produced by the hands of a skilful spinner. This machine has hence been denominated in the spinning districts of Lancashire, an "*Iron Man*," and the first of them set to work by the patentee, was emphatically called ADAM, and is generally known under that name for a considerable distance round that county.

Plate XII, fig. 1, represents the improved spinning mule and its appendages as seen sideways, that is, looking towards the part called the head, the whole being drawn geometrically, and the mule carriage represented partly in section. A, is the roller beam and creel upon which the bobbins containing the rovings of cotton are placed, the yarns having been previously prepared for spinning by the ordinary means; B, is the mule carriage, running to and fro upon wheels as in other mules, for the purpose of drawing and stretching the yarns as the carriage recedes, and afterwards winding them on to the cops as the carriage advances; C, is the head or machinery, stationed opposite the end of the carriage, by means of which, the different evolutions of the parts for spinning and winding are performed.

The power of a steam engine, water wheel, or any other prime mover, is in the first instance communicated to a rotatory drum, situated in any convenient part of the building, from whence a strap passes to a pulley on the main axle of the head where all the movements of the mule originate.

Upon the main-axle of the head there is keyed, or otherwise secured, a fast pulley *a*, and behind this there is a loose pulley, the latter of which, slides round upon the axle. The fast pulley *a*, being turned by a strap *b*, *b*, leading from the large rotatory drum-barrel above, causes the main-axle, and with it the rim-wheel *c*, to revolve, and a band from the rim-wheel passing round the pulley *d*, called the rim band pulley, turns that likewise. Affixed to the axle of *d*, there is also another pulley behind, called the drum band pulley, and this turning by the before described rotation of *d*, causes the band *e*, *e*, to traverse, which drives the horizontal drum-wheel *f*, (mounted in the mule carriage) and consequently, turns the several drums *g*, and the whole series of spindles *h*, placed along the carriage.

A bevel wheel or pinion at the front extremity of the main-axle, turns what is called the tumbling shaft *i*, and this shaft having also at its other extremity a bevel wheel, drives the drawing rollers *k*, and causes them to deliver the yarns to the spindles.

A pinion (not seen in the figure) upon the main-axle, turns a carrier wheel *l*, which drives the scroll pulley *m*, and a cord or band *n*, *n*, *n*, called the scroll band being attached to, and passed round this and another scroll pulley *o*, and round the four guide pullies *p*, *p*, *p*, *p*, will by the rotation of the rim-wheel be made to traverse. The two ends of this cord or scroll band are made fast to the mule carriage, and hence it will be perceived that as the rim-wheel *c*, and scroll pulley *m*, go round, the traversing cord *n*, will draw the mule carriage along, which runs freely upon its wheels.

Things being thus arranged, let it be supposed that the rim-wheel *c*, is moving round in the direction of the arrow, the scroll-pulley *m*, will consequently revolve, and cause the band *n*, to traverse, drawing the mule carriage toward the right hand, away from the roller beam: this is called *running out the carriage*. At the same time the pulley on the axle of *d*, being turned by the band from the rim-wheel as before described, will traverse the band *e*, which causes the drum-wheel *f*, and the drums *g*, mounted in the carriage, to revolve, and to put all the spindles *h*, in rapid rotation. The drawing rollers *k*, by the means before described, now giving out the yarns or rovings *u*, *u*, *u*, these yarns become stretched as the carriage proceeds in its retreat, and spun into the required threads by the time the carriage stops.

The operations of stretching and spinning the yarns or threads being thus effected, which is by nearly the same means as in other mules, the winding of the threads on to the spindles, so as to produce regularly shaped cops, is the next business to be performed, and which in ordinary mules is done by the hands and judgment of the spinner, but in this improved mule is effected by the newly contrived mechanism.

The carriage having run out to its full extent, the strap *b*, *b*, which leads from the large drum barrel, is now shifted from the fast pulley *a*, on to the loose pulley behind it, upon the main axle, by which the rotatory action of the rim-wheel, and all the other wheels and pullies connected thereto, and also the spindles, immediately cease; and the carriage becomes stationary. The winding of the threads upon the cops is now about to take place, and is performed by the following means:—

Affixed to the back of the loose pulley, is a toothed-pinion, which consequently turns with it, and by means of a carrier wheel taking into its teeth turns a wheel behind upon the axle of the pinion *q*. This axle bears at its front extremity upon a lever bar *r*, called the bearing bar, which bar is raised as the carriage runs back by a projecting piece extending from the side of the carriage, acting against the under side of the inclined plain *s*, of the pendant arm, that is attached to the bar *r*; and the bar being thus raised is held up by a catch *t*; and the pinion *q*, is by these means put in gear, with the rack on the under side of the sliding bar *v*, *v*. By the rotation of the loose pulley which is now actuated by the band *d*, the pinion *q*, is made to revolve as before said, and the teeth of this pinion taking into the rack on the under side of the bar *v*, causes that bar to move forward, that is towards the left hand.

The bar *v*, having slidden a little distance to the left, the teeth of a short rack on its upper side comes into gear with the toothed wheel *x*, affixed to the main axle of the head, when the progress of the rack bar causes the axle with the rim wheel *c*, to turn part of a revolution backwards, or the reverse way to that pointed by the arrow. The band passed from the rim wheel *c*, over the pulley *d*, will as it retrogrades cause the band *e*, to traverse in an opposite direction to that before described, and consequently to drive the pulley *f*, the drums *g*, and all the spindles *h*, the contrary way. This retrograde movement of the spindles is for the purpose of untwisting such portions of the threads as were coiled about the noses of the cops *j*, at the tops of the spindles, when the spinning ceased, and which movement is called *backing off*, and is necessary in order to bring the threads straight previous to winding them upon the cops.

The *winding on* is now performed by the following means:—attached to the end of the sliding bar *v*, at *w*, there is a chain *z*, passed over the pullies 1, and 2, and at the lower extremity is made fast to a lever 3, hence it will be seen that as the bar *v*, slides forward, the chain *z*, raises the lever 3. At this time the situation of the carriage B, is such, that the foot of the vertical rack bar 4, connected to the carriage, is immediately over the lever 3, and the raising of this lever by the chain *z*, as described lifting the vertical bar 4, causes its rack to turn a small toothed wheel 5, to the axle of which the arms 6, of the faller wire are attached. This faller wire extends along the carriage for the purpose of guiding the threads higher or lower, so that they shall wind uniformly on to the cops *j*, as shewn by the dots.

By the action of the rack 4, and wheel 5, as described, the faller wire is depressed, and the reverse end of the faller lever lifted until a friction roller at its extremity 7, has been brought on to the upper surface of a bar 8, which bar is called the *copping plate.*

As the rack-bar *v*, slides along in the manner above described, an inclined plain on its side presses against the catch *t*, and by pushing it back, liberates the bearing bar *r*, and allows it to fall, which withdraws the pinion *q*, from the rack on the under side of the sliding bar *v*, when this bar is immediately drawn back again by the weight of the chain *z*, and lever 3, into the situation shewn in the figure. This takes place when the backing off ceases, before the carriage moves in.

As the carriage *runs in*, that is returns towards the left, the threads being guided to the bottom of the cop, the friction roller 7, runs along the upper surface of the inclined copping plate 8, and the faller wire 6, at the reverse end is by that means made to rise as in the dotted arc, guiding the winding of the thread, (which is here called the chase,) upon the cop which coils gradually in a spiral, with mathematical precision. The winding on part of the process when performed by hand, requires great care, experience, and judgment in the operator, but in this improved mule, it is effected by the construction and action of the mechanism.

The fulcruum of the catch lever *t*, is a nut upon a screw shaft 9, which shaft is progressively turned, and consequently the catch *t*, moved laterally by a click that strikes against a ratchet wheel every time that the bearing bar is lifted. The reason of thus progressively shifting the catch that supports the bearing bar is, because as the winding goes on, the cop increasing in height, the action of backing off the thread is required to be diminished; the inclined plain upon the sliding bar must therefore be sooner brought in contact with the catch lever *t*, and which on being pressed back, will hence sooner liberate the bearing bar, and withdraw the pinion as described from the backing off rack, and consequently shorten its traverse.

It is also necessary to depress the copping rail 8, as the cop increases in height, in order that the chase may be laid uniformly. This is done by a pinion 10, on the last mentioned screw shaft which actuates bevel gear. There is an horizontal shaft 12, connected to this gear, with pinions at its extremities, which take into wheels that are nuts working on the screw shafts which support the copping plate 8, and thus the copping plate is made slowly to descend as the cops increase.

The main axle being now stationary, and also the rim wheel and its appendages, the going in of the carriage is produced by the scroll pulley *o*, in the following manner: an auxiliary band 13, leading from the main drum barrel above, passes over a pulley 14, upon the axle of which there is a spur wheel that takes into another wheel upon the axle of the pulley 15. From this last mentioned pulley, a strap extends through a guide to the going in scroll *o*. This going in scroll has upon its axle both a fast and loose pulley, and the bearing bar *r*, in falling strikes a lever which causes the strap to be shifted from the loose to the fast pulley, when the going in scroll is immediately made to revolve, and the band *n*, to traverse the reverse way to that previously described, which draws the carriage towards the left hand. At this time, also a pendant lever 16, carrying two friction pullies is allowed to fall against the loose vertical strap 17, extending from a pulley on the axle of 14, down to another pulley on the axle of the drum band pulley *d*. The weight of this lever causes the strap 17, to become tight, and consequently by its friction now to turn the pulley *d*, and its axle, and to traverse the band *e*, by which the drums and spindles are made to revolve, for the purpose of winding the threads upon the cops. The weight with which the pendant lever falls against the loose vertical strap 17, must be such that if the yarns pull too tightly, the strap shall be enabled to slip round upon the pulley, else the yarns would be wound too tight, and perhaps break. When the carriage has ran in, a pin on its side strikes a lever that shifts the strap again on to the loose pulley of the going in scroll, and stops the carriage, and by similar means, the pendant lever 16, is thrown back and the tension of the vertical strap 17, removed.

The roller 7, at the lower end of the faller lever, having as the carriage advanced, traversed along the top of the copping rail 9, now falls down into the situation shewn in the figure, raising the faller wire 6, above the tops of the spindles, and the strap *b*, having been conducted on to the fast pulley *a*, as in the former instance, the carriage is again run out, and the drawing, stretching, and spinning of the yarns, performed again exactly in the manner above described.

Such is the general construction and operation of this ingenious combination of machinery, some of the minutiæ of which we have been compelled to omit in our description. We have recently seen several of the above mules in operation, and the work which has been produced by them, we have no hesitation in asserting to be equal to, if not exceeding, both in quality and expedition, the productions of the most competent spinners, and that the cops formed are very much superior in shape, to those wound in the ordinary way by hand.

[*Inrolled September,* 1825.]

To HENRY CHARLES LACEY, *of Manchester, in the County Palatine of Lancaster, Coach Master, for his new Invented Apparatus on which to suspend Carriage Bodies.*

[Sealed 18th November, 1826.]

THIS invention is a newly contrived spring to be attached to carriages, for the purpose of affording an elastic bearing to the body of the carriage, without allowing it to swing so much in a lateral direction as carriage bodies generally do when suspended upon grass-hopper springs, or such other springs as are commonly employed for that purpose.

The springs proposed by the patentee are to be made of steel, wire, or rods coiled into a helical figure; or a number of elliptical segments of steel combined together; or under some circumstances caoutchouc (Indian rubber) cut into cubes. The various modes of adapting which several kinds of springs will be understood by reference to the figures in Plate XIII.

Fig. 1, represents a side view of a stage coach with the improved springs adapted thereto, and fig. 2, is a back view of the same, shewing more perfectly the manner of attaching the springs to the carriage, and suspending the body. The remaining figures 3 to 9, exhibit the several modifications of the invention, or different modes of constructing the springs, which are here drawn upon a larger scale, the boxes that enclose them being cut in section to exhibit the parts within.

Fig. 3, is a section of a cylindrical box *a*, *a*, containing one or more helical springs; *b*, is the base plate or bottom of the box made of metal, the cylinder and its bottom being attached together, by screwing, soldering or any other convenient and ordinary mode of connection, and which box is made fast to the rail of the carriage, by bolts or other fastenings; *c*, is the helical spring made of well-tempered steel, and of a strength suited to the load, that it is intended to bear, which would be known to any experienced workman; *d*, is another helical spring within the former, intended to increase the strength of the support, and which is recommended to be twisted in an opposite direction to the former, in order to prevent their entangling. There might be a third, and fourth spring within these for the purpose of affording increased support, and for stage coaches it is recommended that four springs be introduced; *e*, is a circular plate or disc, nearly fitting the interior of the cylinder, and bearing upon the top of the spring or springs; which plate is to be made of gun metal. Through the centre of the base plate of the cylindrical box, a pillar *f*, *f*, is passed, which is secured at top by a nut screwed down upon the cap *g*. The plate *e*, is perforated in its centre, in order to allow the pillar *f*, to pass through it. A socket is also made on the under side of the plate, for the purpose of guiding it as it slides up and down upon the pillar. *h*, *h*, is a shackle bar, the central part being enlarged, and a hole made through it to admit the pillar *f*, upon which it slides. The under side of this shackle bar is shewn at fig. 4. The bar passes through long slots or chase mortices in the sides of the cylindrical box, and at the ends of the bar are the shackles, to which the body of the vehicle is suspended as shewn in figs. 1 and 2. The hole through the shackle bar is considerably larger than the pillar *f*, and is counter-sunk on the under side, for the purpose of fitting and bearing upon a boss or convex part on the upper side of the plate, by these means a sort of ball and socket joint is produced, which allows a certain degree of lateral play to the shackle bar, accommodating it to the rising and falling of the sides of the carriage, as the wheels run over uneven ground.

It will now be seen that the weight of the body of the vehicle suspended upon the shackle bars, as at figs. 1 and 2, is supported by the springs within the boxes which form the elastic bearings, and as the carriage passes over inequalities in the road, the action of the springs within the boxes cause the shackle bars which support the body, to slide up and down in the long slots or chase mortices in the sides of the boxes. In order to prevent too great an action of the springs, when the carriage is but lightly laden, the patentee has introduced a helical spring *k*, within the cylindrical box above the shackle bar, which is intended to act as a recoil spring, and prevent the shackle bar from jumping up.

The invention when applied to vans, and such other carriages as are employed for the conveyance of heavy loads, is exhibited in fig. 5, which is the section of a double box or cylinder containing two sets of helical springs. The springs *c*, and *d*, placed in the lower box are precisely the same as those described in fig. 3, with the circular plate or disc *e*, bearing upon the springs, and sliding upon the central pillar *f*, the shackle bar *h*, to which the body of the vehicle is attached, pressing upon this circular plate or disc, in the manner already explained. In the upper compartment of the cylindrical box, or rather in a distinct box placed above the lower one, there are similar helical springs *l*, bearing upon the partition plate *i*, *i*; and which springs are pressed upon above by the plate or disc *m*, which is attached to a long tube or socket rising from the lower plate or disc *e*. Hence it will be perceived that the weight of the body of the vehicle, suspended to the shackle bar, is supported alike by the springs in the upper and lower boxes.

Various other arrangements of helical springs may be applied to the same purpose, for instance, the springs instead of being placed concentrically round a pillar, may form separate columns round a number of pillars, inclosed in the same box, and which pillars may pass through separate apertures in the plate or disc above.

Fig. 6, represents the section of a box containing two or more series of segment springs, combined in the form of what are commonly called elliptical springs. Fig. 7, is a plan or horizontal view of the box, which in this instance is square; and two series of springs are placed within it as at *c*, *c*, *c*, bearing against the bottom *b*. The sides *a*, *a*, of the box, have grooves formed in them, for the purpose of keeping the springs in their places; *e*, is the plate which bears upon the springs, and *f*, is the pillar passing up through the middle of the box, as in the former instance guiding the plate; *h, h*, is the shackle bar also sliding upon the central pillar, to which the body of the vehicle is suspended, and thus an elastic bearing is afforded by the resistance of the elliptical springs.

Fig. 8, represents a section of a square box, containing instead of metallic springs, cubical blocks *c, c, c*, of caoutchouc (Indian rubber), and fig. 9, is a plan or horizontal view of the same; *b*, is the bottom plate of the box upon which the series of blocks *c, c, c*, are placed, one above another, each set being separated by a plate *n, n, n*, with projections which confine the blocks in their places but allow of their expanding laterally, when pressed upon; *e*, is the pressing plate, and *h*, the shackle bar bearing upon it, both of which slide upon the central pillar *f*, passed up the middle of the box, and are confined at top by a nut. The body of the vehicle being suspended to the shackle bar, as in the former instance, the cautchouc blocks form the elastic bearing.

Fig. 10, exhibits a mode of adapting this invention to a two wheeled carriage; *a, a*, are two boxes, with helical springs within, as in the former figures, these boxes are fixed by means of their bottom-plate to the axle-tree. A pillar passes up through the centre of each box, and upon it the circular plate or disc slides, which presses upon the top of the spring. In this instance, the shackle bar is dispensed with, there being arms or pins extending from the circular plates which are let into the shackle rings *b, b*; and *c, c*, are iron brackets affixed to the side rails of the gig for the purpose of attaching the shackle rings. It will now be seen that the pins of the circular plate being inserted into the shackle rings, the whole weight of the body of the vehicle will, through the circular plates, bear upon the springs, and thus form an elastic bearing to the gig.

The patentee concludes by saying that he has described the particulars of his invention of a new apparatus on which to suspend carriage bodies, and various modes or modifications of construction or putting the same into operation, he might have described several other variations of the same plan, but conceives that enough has been explained to render the principles of the invention perfectly evident, he therefore in conclusion, states that the peculiar feature of novelty which he claims as his invention consists in attaching the body of a carriage to shackle bars, rings, or plates, which are supported by elastic bearings, constituted of springs of any of the kinds or constructions described.

[*Inrolled May*, 1827.]

We have seen this invention applied to a stage coach, the motions of which are extremely easy, and the jolts of the carriage as its wheels pass over obstacles in the road, are by the peculiar action of the springs softened, and indeed rendered almost imperceptible; but the great advantage of the improvement is, that the motions are up and down, and not swinging, consequently, the danger of overturning by loading the roof of the coach, is in a very great degree removed by the employment of these springs.—
Editor.

To George Tompson, *of Wolverhampton, in the County of Stafford, Gentleman, for his Invention of Improvements in the construction of Riding Saddles.*

[Sealed 28th June, 1827.]

The improvements, proposed under this patent, consist in constructing saddle-trees of iron or steel, instead of wood as usual, the object of which is that the frame of the saddle shall be extremely firm, and consequently, better calculated to meet and support the elastic resistance of the stuffing than the ordinary construction of saddles, in which the wood-work is susceptible of some degree of elasticity.

The construction of the iron or steel-framing of the saddle-tree is shewn in Plate XIII, fig. 11; *a*, is one of two bars called the main-bars, which extend along the sides of the saddle, and are fastened by rivits or otherwise, to the main-head *b*, at one end, and to the cantle *c*, behind. There are other cross and lateral pieces introduced for bracing the frame-work properly together, and *d*, is one of the staples for the reception of the strap of the stirrup. The patentee has in his specification stated at great length the forms and dimensions of all the parts or pieces of the frame-work, and particularly described the mode to be pursued in covering this metal frame with webbing, for the reception of the wool and other elastic stuffing, and also the spreading and stitching of the outer covering of leather. As however, the invention consists simply in constructing the framing or saddle tree of iron or steel, we deem it unnecessary to trouble our readers with a more minute description of the mode of manufacturing these improved saddles.

[*Inrolled December*, 1825.]

To Richard Jones Tomlinson, *of the City of Bristol, Gentleman, for his Invention of an Improved Framework for Bedsteads and other purposes.*

[Sealed 26th November, 1825.]

This invention applies to iron bedsteads, that is, to the construction of the rails or framing of bedsteads, to be made of iron, and consists in forming the rails at the sides and ends of the bedstead in a peculiar manner, in which very considerable strength and lightness is combined.

Plate XIII, fig. 12, represents the horizontal frame of the bedstead when put together; *a, a,* is a bowed-rail or bar of iron enlarged at the ends, for the purpose of receiving the connecting screws; *b, b,* is a straight rod forming the string of the bow, and *c, c, c,* are a series of bracers or brackets, holding the bow-bar *a,* and string-rod *b,* together. The end rails are similarly formed to the side-rails, and are connected by screws as at *d.* The sacking is laced to the framing by passing the cords through the eyes of the sacking, and over the rods *b;* or if laths or rails are preferred in place of the sacking, they may be so constructed, as to bear upon a bar passed along the middle of the frame, with their ends resting upon the side rods *b.*

The patentee says, that in this construction of rail the greatest strength would be afforded by attaching the sacking to the bow-bar *a,* but for the sake of convenience it is attached to the rod *b,* and the tension of the rod and bar are preserved by the brackets or stay *c.*

[*Inrolled December,* 1825.]

To the Rev. William Barclay, *of Auldeare, in the County of Nairn, for his Invention of an Improved Instrument to determine angles of altitude or elevation without the necessity of a view of the horizon being obtained.*

[Sealed 30th July, 1825.]

The instrument improved by the patentee is a sort of portable equatorial, to be used in the hand of an observer for ascertaining angles of altitude or elevation of any celestial or other object. The instrument is constructed with a graduated circle and vernia, and has a telescope and other appendages, as such instruments usually have, the peculiar feature of novelty being a transparent circular tube, extending round the graduated circle, which is half filled with alcohol, and is to be used for the purpose of shewing the true level or horizontal line.

The instrument being properly adjusted in all its parts, and held by the left hand in a vertical position, the telescope is elevated to the object, about to be observed, by turning a rose headed screw with a pinion upon it, taking into a circular rack. When the object is in the field of view of the telescope, the finger of the right hand of the observer, opens a small stop-cock, which is placed in the circular tube, containing the alcohol, and by so doing allows the alcohol to flow slowly from the most elevated part of the circular tube into the lower part of the tube. As the object about to be observed approaches the cross hairs in the telescope, the stop-cock is to be gradually closed, and when the observation is over the upper surface of the alcohol in the circular tube represents the horizontal line at the time of observation.

The number of degrees between the surface of the alcohol, in the elevated arc of the tube, and the vernia, opposite the axis of the telescope, will now shew the altitude or angle of elevation of the object observed, which may be read off by the edge or upper surface of the alcohol in the circular glass tube, cutting the graduated circle.

In order to render this instrument available at night, as well as in the day-time, a small lamp is attached to the side of the instrument, suspended upon jimbles, and a reflector is placed contiguous to it, for the purpose of throwing a strong light against the graduations, that they may be read off conveniently at the time of observation.

Instruments of this kind may be variously constructed, the improvements not applying to the principles of construction, or form of the instrument, but to the introduction of the transparent circular tube, containing the alcohol, with the stop-cock, through which it is allowed to flow gently and without undulation to its level, and thereby represent the horizon artificially, when the real horizon cannot be seen.

[*Inrolled September*, 1825.]

To JOHN WILLIAM HIORT, *Chief Engineer, at our Office of Works and Public Buildings, Whitehall, Architect and Surveyor, for his having Invented and found out an Improved Chimney or Flue, for Domestic and other purposes.*

[Sealed 8th November, 1825.]

THE principle feature of this invention is a peculiarly shaped brick, by which chimnies or flues may be constructed without angles. The brick is of a wedge form, that is, its upper and lower surfaces are not parallel to each other, and one of its sides is curved to the figure of a quadrant of a circle. Four of these bricks joined together form an entire circle, and by so uniting them, the interiors of chimneys or flues are to be built, making them cylindrical in such parts as are not bent out of the upright. But when it is necessary to incline the chimney or carry the flue in a horizontal position, then the smaller ends of the wedge shaped bricks are placed in connections, that is, in one direction, and the flue is made to curve.

Plate XIII, fig. 13, shews a section of a chimney, built upon the improved plan, with wedge-formed bricks, in which it will be seen that to construct the cylindrical parts of the chimney, the bricks are placed with the wedges, in opposite directions, so that two bricks when united, that is one upon the other, form a parallel figure; but where the chimney bends or winds round, there the bricks are placed so that the points of the wedges shall all stand one way.

The intention of the patentee, and his mode of effecting the object, must be so obvious, that further explanation of this part of the invention appears to be unnecessary, as every bricklayer would know how to proceed in erecting a chimney upon this principle; the horizontal figure of the brick, and the mode of placing four of them together, forming the circular chimney, will be seen in the plan view, fig. 14, and it is only necessary to observe that the joints should be blocked, that is, crossed by the solid parts of the bricks above and below, in order to render the work secure.

A further object of improvement proposed by the patentee, is to construct air-chambers round the flues, which shall be filled with heated air, and thereby keep the chimney sufficiently hot to prevent the condensation of the ascending vapour, which in ordinary built chimnies, is one great cause of the smoke returning into the room. The shaft of the chimney it will be seen by fig. 14, is made square with ordinary bricks as usual, and within this the circular channel is formed by the improved bricks, leaving vacant spaces behind, between the square and the circular shafts. These spaces being open at their lower extremities, near the fire-place, soon become filled with heated air, and being closed at top, and air-tight, the heated air is prevented from escaping, consequently, the shaft of the chimney becomes warm throughout, and by that means a much better draft of the smoke is produced, than in those chimnies where the smoke and vapour rises merely by its own levity.

Chimnies constructed upon this improved principle will allow of little or no soot depositing itself, which is considered to be a great advantage, and to promote that object, the inner circle of bricks is proposed to be vitrified.

[*Inrolled December*, 1825.]

To CHARLES FREUND, *of Bell Lane, Spitalfields, in the County of Middlesex, Sugar Refiner, for his Discovery of an Improvement or Improvements in the process of Refining Sugar.*

[Sealed 26th July, 1825.]

THE improved process employed by the patentee for refining sugar, which he denominates clearing the pans, is intended to supersede the present practice of using bullocks' blood, and such other albificacious matters, and consists in the application of pot or pearl ash and fuller's-earth to the sugar in the boiler or pans, as a means of removing the colouring matter.

The process is as follows:—In the pan usually employed for boiling the sugar, a quantity of water is placed, say eighty-four gallons, to which fifteen pounds of

American pot or pearl ash is to be put, and to these eighteen hundred weight of raw or Moscovado sugar is to be added. This compound having been well stirred to break the lumps, and mix the whole perfectly together, from twenty to thirty pounds of the whitest fuller's earth dissolved in water to the consistency of cream, is now to be added, and the whole well agitated during the boiling process, and fresh water introduced as the process goes on, to keep the syrup in a sufficiently fluid state.

As this clarifying process goes on, the boiling is to be occasionally suspended, for the purpose of removing the scum, which will float upon the surface, and when the boiling has been continued for a sufficient time, the syrup is to be withdrawn in the usual way, and placed in a vessel for the purpose of settling.

This vessel is to be furnished with three cocks at different heights from the bottom, by means of which the syrup is to be withdrawn as it becomes settled and clear: drawing of course from the upper cock first, after it has stood perhaps twelve hours to settle, and the next day from the second cock, and so on, until as much has been drawn as will run clear.

The vessel is then to be tilted, which may be done by depressing one end, and for this purpose it is erected upon a frame supported by an axle, placed a little distance from the centre, the other end of the frame being sustained by a leg which is a screw. In the first instance the vessel is placed perfectly level, but when the syrup has been drawn off, down to the level of the lower cock, then the vessel may be tilted by turning the screw leg, and the remainder of the syrup drawn off as long as it will run clear.

The remainder of the syrup, with the sedement, may be ultimately withdrawn, by removing a screw plug, placed in the bottom, and this with the scum, or any other thick or coloured syrup, may be again put into the clearing pan, and operated upon as described above.

The patentee states, that his claim of invention is simply the employment of pot or pearl ash, or other such vegetable alkaline matter, with fuller's earth, for the clarification of sugar, and that the same is applicable to clarifying of sugar or molasses in different states, that is it will apply to the clarification of the raw Moscovado sugar, to the bastards, and to the molasses, all of which purposes come within the meaning of his patent right.

[*Inrolled January,* 1826.]

To VERNON ROYLE, *of Manchester, in the County Palatine of Lancaster, Silk Manufacturer and Throwster, for his Invention of certain Improvements in the Machinery for Cleaning and Spinning of Silk.*

[Sealed 1st November, 1825.]

THE subjects of this patent are first, a method of clearing or equalizing the thickness of silk yarns or threads, by passing them between a pair of cylinders, so nearly in contact as to stop the progress of the thread whenever a knot or gouty part presents itself. Secondly, the introduction of studs or pegs made of glazed or enamelled materials, as tension pins, over which the silk is to slide in winding as it proceeds from the bobbin.

Plate XIV, fig, 1, shews a portion of the machine in which the cylinders are mounted for clearing the silk. One end of the cylinders *a, a,* are fixed in the standards *b, b,* and the ends of the cylinders *c, c,* are introduced into slots in the said standards, by which they are enabled to be placed at any required distance from the upper cylinders, so as to leave a parallel space between the two, equal to the thickness of the silk yarn intended to be passed through them; *d, d,* are adjusting screws, by means of which, the cylinders *c, c,* are raised to their required situation.

The ends of the silk yarns are brought from their delivering bobbins or reals, and passed through between the cylinders *a* and *c,* and are then progressively conducted forward to the doubling apparatus, in the usual way. When any knot or thick gouty part of the silk comes up to the cylinders, they immediately stop its progress, until the person who attends the machine observes it, and removes the gouty part of the silk by the finger and thumb. The intention of this contrivance is to prevent any knots or thick parts of the silk becoming doubled in with the other threads or yarns of uniform thickness, and the threads produced after doubling, by the assistance of this contrivance are consequently of a perfectly equal thickness throughout.

The second part of the invention is shewn at fig. 2, which represents part of a machine for winding; *a, a,* are the spindle bobbins, from which the silk is to be drawn; *b, b,* are the receiving bobbins, on to which it is to be wound; *c, c,* are rails, having pins, pegs, or studs set in them, for the purpose of giving tension to the silk threads as they pass from the bobbins *a* to *b.*

These rails *c, c,* are made to slide or traverse laterally, in order to guide the silk threads so that they shall coil equally upon the peripheries of the bobbins *b, b.* The threads being carried up from the bobbins *a,* are passed round the tension pins, and thence conducted to the bobbins *b*. This kind of operation is not new in the winding of silk, but the making of those pins of porcelain or with any other such glazed or enamelled surface, is said to be new, and is claimed as the subject of this part of the invention.

[*Inrolled December*, 1825.]

To PHILLIP TAYLOR, *of the City Road, in the County of Middlesex, Engineer, for his Invention of certain Improvements in making Iron.*

[Sealed 18th August, 1825.]

THIS invention consists in the introduction of carburetted hydrogen gas into the furnace, where iron ore is smelting, which gas is to be injected in the same way, that air is forced into a furnace by a blast engine.

The patentee prefers to use gas which has been purified; that is, divested of its tar, and ammonia; he therefore proposes the employment of an apparatus similar to that shewn in Plate XIV, at fig. 3. In this arrangement of the apparatus; *a*, is the furnace with the retorts, where the gas is first generated; *b*, is the pipe by which the gas passes from the retorts towards the purifying apparatus; *c*, is a tank destined to receive the coal tar, which passing off by distillation with the gas, deposits itself here by its gravity; *d*, is the vessel containing lime, and other matters for the purpose of taking up the ammonia as the gas proceeds through it by the pipe *e*. After undergoing the purifying process, the gas is conducted through the pipe *f*, into the gasometer *g*, to be stored for use.

The gasometer is a hollow inverted tank, constructed and suspended in the usual way, by means of a chain passed over pullers, which is weighted at the reverse end, for the purpose of counter-poizing it. The gas proceeds from the gasometer through the pipe *h*, in the same way, as it would be conducted to the service pipes of gas burners, and enters the vessel *k*, which is a force pump worked by an engine, for the purpose of injecting a current of gas into the furnace *l*, in the manner of a blast.

The force with which this gas should be impelled by the engine, will depend upon the magnitude of the furnace. The patentee proposes this rule: whenever the blast of air from the blowing machine, is required to be driven by a pressure, equal to one pound upon the inch, the gas should be impelled by a force equal to two pounds upon the inch, and it is most desirable to conduct it into the furnace, about the same place that the nozzle of the bellows is inserted, in order that the carburetted hydrogen gas shall come in contact with the iron, when in a fluid state as it flows down from the furnace on to the hearth below.

In explaining the use of this invention, it is stated, that such kinds of coal as contain the greatest quantity of carburetted hydrogen gas, are best calculated for making iron for foundery or melting purposes; but that there are advantages, under some circumstances, in using stone coal, or such kinds of coal as contain little or none of the gas. It is, therefore, the object of the patentee, to avail himself of the advantages presented, in using stone-coal in the smelting furnace, and in order to compensate for the want of the gasious parts in that description of coal, he proposes to inject carburetted hydrogen gas, in its purified state, into the smelting-furnace, in the manner above described; which, coming in contact with the fluid iron, communicates the carbon thereto, and produces the same effect as if the superior quality of coal had been used in the furnace.

There might be several modes suggested of injecting gas into a furnace, but the mode described above, is thought to be preferable to any other. The patentee has not, however, overlooked the possibility of introducing the matter of carburetted hydrogen in another form, beside that of gas, which would effect the desired object, though, perhaps, not in so eligible a manner; for instance, oil might be conducted, by means of a funnel or hopper, into the tube of a blowing engine, and by the force of the blast, be carried forward into the furnace.

This, and any other contrivance, by which carburetted hydrogen may be conveyed into a furnace, where iron is undergoing the operation of smelting, is claimed by the patentee, as coming under his contemplation, and within the meaning of his patent right.

[*Inrolled February*, 1826.]

To JAMES ASHWELL TABOR, *of Jewin Street, Cripplegate, in the City of London, Gentleman, for his having Invented or found out means for indicating the depth of water in Ships and Vessels.*

[Sealed 14th December, 1825.]

THE apparatus which forms the subject of this patent, is designed to shew the height of bilge water in the holds of ships. It consists of two floats attached to chains and rods, which floats are lowered down to the bottom of the vessel; and the upper parts of the rods are connected to a dial above deck, which indicates the height of the water in the hold by the rising of the floats.

Plate XIV, fig. 6, exhibits the contrivance; *a*, *a*, is a portion of the lower part of the vessel shewn in section; *b*, *b*, is the perpendicular central line of the vessel shewn by dots, in which the main mast would be set in any convenient situation above deck, (perhaps attached to the mast) is the dial plate *c*, with two indexes. Behind the dial plate there are two toothed wheels, over which respectively are passed the chains *d*, and *e*. From these chains wires *f*, and *g*, proceed down to the hold of the ship, and at their lower extremities other small chains are attached, which carry the floats *h*, and *i*.

These floats are protected by cylindrical boxes perforated with holes, and into which boxes the water in the lower part of the vessel has free access: consequently, as the water accumulates the floats rise, and the balance weights *k*, and *l*, connected by the chains *d*, and *e*, and hanging in the boxes near the dial plate above deck, draw up the wires *f*, and *g*, and cause the indexes to turn round upon the dial plate, and point out the height of the water below.

As the vessel rolls there may be water in one side of the hold, and not in the other, hence, one of the floats will be out of action. In consequence of this, the two floats are respectively connected to two distinct indexes on the dial-plate; and when one float is not in action, its index will be stationary, while the other will swim, and cause its index to shew the height of the water.

[*Inrolled February*, 1826.]

To George Holworthy Palmer, *of the Royal Mint, Civil Engineer, for his new invented Machinery for Propelling Vessels through the Water, to be effected by Steam or any other power.*

[Sealed 15th September, 1825.]

This invention is a mode of adapting horizontal paddles, to a boat or other vessel, and giving to these paddles a reciprocating traversing motion, lengthways of the vessel, for the purpose of propelling it along the surface of the water. The paddles may be made to act on the sides of vessel or under it, between false keels, the mode of adapting which is shewn in Plate XIV.

Fig. 4, is the external appearance of the side of a vessel, with the propelling apparatus attached thereto; *a*, *a*, is the framing upon which the wheel and carriage pullies are mounted; *b*, is the main revolving axle, upon which there is a rigger *c*, turned by a band from a steam engine; *d*, is the propelling wheel, in the periphery of which, there are pins or studs taking into the links of an endless chain *e*, *e*, *e*. At the extremity of the framing, the guide pullies *f*, *f*, are placed for the purpose of distending and guiding the chain; *g*, is one of the paddles attached to the chain, by a joint, and hanging perpendicularly, which situation it would preserve, as it traversed along the side of the boat, from the head towards the stern, being confined by a check chain.

Rotatory motion being given to the wheel *d*, in the direction of the arrow, the chain *e*, will be carried forward, and the paddle *g*, made to traverse through the water, on the side of the vessel, towards the stern, preserving its perpendicular position as shewn, when, by the resistance of the water against the paddle, the vessel will be impelled forward. The paddle having reached the end of its stroke, the wheel *d*, must now be made to turn in the opposite direction, to the arrow, which will cause the chain and the paddle to traverse back again, in doing which, the paddle will no longer preserve its perpendicular position, but will turn up on its joint, and assume nearly a horizontal position, as shewn, by dots passing through the water edgewise, and thereby meeting with little or no resistance.

It will now be clearly seen that by a repetition of alternating actions of this axle *b*, and wheel *d*, the paddles on both sides of the vessel will be made to traverse to and fro in the manner described, and the vessel to be accordingly propelled forward.

Another mode of adapting the same principles of reciprocating paddles is shewn at fig. 5, in which the paddles are intended to act under the bottom of the vessel between false keels. In this figure the vessel is shewn in section, supposed to be cut through the middle longitudinally; *a*, is the main revolving axle put in motion by a band from a steam engine, passed over a rigger as in the former; *b*, is the main wheel; and *c*, *c*, the traversing chains to which the paddles *d*, *d*, are attached by joints. The wheel *b*, has a double groove for the two chains, and these being carried round the wheel in opposite directions, cause the respective paddles attached to each chain to move contrary ways, that is, while one paddle is in the act of propelling the other is retrograding in an horizontal position.

The particular advantages of this last mode of propelling vessels are considered to be these: first, that by placing the paddles under the bottom of the vessel between false keels, any variation in the lading which shall cause the vessel to lay more or less deep in the water, will not effect the power of the paddles. Secondly, whatever angle the sides of the vessel may make to the surface of the water, as in rolling upon a turbulent sea, still the propelling paddles will have their full effect. Third, when canal boats are adapted with paddles under the bottom in this way, the water will receive scarcely any sensible agitation, and consequently the banks will not become injured.

The patentee concludes by saying that not having discovered any new principle, as connected with propelling all that he lays claim to his the new modification of the known principles, by which he is enabled to propel vessels on water, however large their dimensions, with more expedition, cheapness and safety than has been effected by any other mode of propelling hitherto practised.

[*Inrolled March,* 1826.]

Original Communications.

To the Editor of the London Journal of Arts, &c.

SIR,

A PAPER has recently been presented to the Royal Society concerning the influence of lime-stone, chalk, and some other strata on the atmosphere, by WILLIAM ALEXANDER MAKINNON, Esq. F.R S. the following slight sketch of which you will perhaps think of sufficient interest to merit a place in your Journal. The hypothesis advanced, and the facts said to have been observed, are that the dryness or dampness of the air and the vivacity or sedateness not only of a few individuals, but even of a whole race of people, depends more on the character of the sub-strata of the earth on which they dwell, than is commonly imagined. The following is the summary of the leading points :—

Mr. M. begins his paper by stating, that residing in the vicinity of Southampton, about seven miles from the great bed of chalk that runs through part of Hampshire, and the neighbouring counties, he was struck with the difference of the air when on the chalk, to what it was when going towards the New Forest, though both were equally distant from the water. That in consequence, experiments were tried with the hygrometer (De Luc's Whalebone and Daniels,) and the result of these was, that invariably a greater degree of dryness was found in the atmosphere over the chalk, than over clay or alluvial substances. Mr. M. however, adds that the hygrometer is an instrument so very uncertain in its results, and so liable to inaccuracy, that little reliance ought to be placed, or experiments made with it, unless confirmed by other observations. He says, however, that every subsequent observation confirms the hypothesis, that if chalk is laid on a field as a dressing, it will at the end of some hours become damp, even if no rain or little dew has fallen, which dampness can only arise from the atmosphere. Also, that turf grass over chalk or lime-stone, even in the hottest summer, always looks green and healthy, which must, Mr. Mackinnon thinks, arise from the absorption of atmospheric moisture, by a sort of capillary attraction from the chalk or lime-stone, which moisture passing through the slight covering of mould, keeps the roots of the grass sufficiently moist to look green, whereas the same heat burns up turf-grass over clay, or alluvial substance, or gravel, in a remarkable degree. Mr. Mackinnon brings forward many other arguments in favor of this assertion. He says also, that from this absorbing power or capillary attraction of atmospheric damp by certain strata, a house built on a chalk foundation, or of chalk materials, will commonly be damp, and for the same reason if lime-stone or sea sand is used. The paper further states, that if the dryness or dampness of the atmosphere is effected by the stratum, that must affect the spirits or the health of the inhabitants, and even some other qualities of individuals or nations, may depend more on the sub-stratum than is commonly imagined.

I am, Sir, &c.

A. Z.

To the Editor of the London Journal of Arts, &c.

Sir,

As you did me the favor to insert in your very valuable Journal, my account of the Egyptian and Athenian years, I feel assured you will also give the Roman year a place in your next. The Roman year has been subject to many variations; in consulting the different authors of antiquity, it appears that before Romulus, the Latins began their year, first, at the time of the autumnul equinox, and afterwards at the summer solstice, but that the first king of Rome, fixed the commencement of the year at the vernal equinox. Authors do not agree as to the number of the months which composed the year of Romulus: some of them supposed it was composed of 304 days or ten months; others, such as Plutarch, give to it 360 days; but he states, that from the time of their first king, the Romans had their months very unequal, from twenty days and upwards, unto thirty-five days, without order or regularity, contenting themselves, so that the days when added together, made 360. The ancient Arabs, according to Chardin, divided their year in the same way.

Numa altered very considerably the year of Romulus, and fixed the commencement of it in January, after the winter solstice; he gave it only 354 days, or according to some authors 353 days. The months contained only twenty-nine days, except March, May, June, and October; these months were composed of thirty-one days each, and February only twenty-eight days. But in order that this year should correspond with the Solar year, Numa intercalated into every two years a month of twenty-two days, named *Merkedonius;* but as he perceived that this intercalation, when added to the year of 355 days, rendered it too long by one day in each year, he ordered the suppression of twenty-four days, at the end of each twenty-fourth year. The intercalation took place between the 23d and 24th of February, which before the time of Numa was the last month of the year. By this he perhaps wished to perpetuate its memory, in placing the intercalation at that period; which, with almost all nations, had place at the end of the year. During the Republic, the order of the year established by Numa was forgotten; the Pontiffs to whom was left the care of fixing the time of the Festivals, introduced great disorder into the Calender; they intercalated often more or less, according as they wished to prolong or diminish the duration of the power of the magistrates; or, influenced by motives of interest or envy, they endeavoured either to please or injure the persons who farmed the revenue of the Republic, by rendering the year longer or shorter.

At last, Julius Cœsar, to remedy these disorders, brought from Alexandria the Astronomer *Sozigènes*, who reformed the year, and gave it 365 days six hours: on account of these six hours, he ordained, that they should add every four years, one day to the year after the 23rd of February, or the next day, after the 6th day, before the *Calèndes* of March; but this month, from religious notions they conceived, should not consist of more than twenty-eight days. They called the day which was added *Bis-sextus*, or second sixth day, from which cause, this year was called *Bissextile*; but that the order of the festivals should remain unchanged, Julius Cæsar only added the days to the end of each month. This reformation of the Calendar took place in the year of Rome 709, forty-five years before *Jesus Christ*; and in the year 4669 of the Julian period, or that of Julius Scaliger. The Romans counted the days of the month by *Calendes*, *Nones*, and *Ides*. The *Calendes*, or the first day of each month, was consecrated to *Juno*; their name was derived from the antient Latin word *Calo*. I convoke, because it was this day that was set apart for the assemblies of the people and the sacrifices. From the *Calendes* to the *Nones*, there was four days in the months of January, February, April, June, August, September, November, and December, and six days in the other months. These days were computed according to the distance from the *Nones*. The 2nd of January was the 4th of the *Nones*, and the 3rd of October was the 5th of the *Nones*. This name meant *ninth*, because nine days always intervened between the *Nones* and the *Ides* inclusively.

The latter were the 13th day in those months on which the *Nones* were the 5th; and the 15th day of those months on which the *Nones* were the 7th. The *Ides*, which were sacred to Jupiter, fell out on the day of the full moon. It is thought that this word anciently was derived from the Greek word, which signified *face*, and shewéd that the Moon was seen at the full. As to the other days of the month, they were reckoned by their distance from the *Calendes* of the following month, in the same manner as the days preceding the *Nones*, with due attention being paid to whether the month consisted of thirty or of thirty-one days; for instance, the 14th of January, or the day after the *Ides*, was the 19th of the *Calends* of February; the 14th of February was the 16th of the *Calends* of March; the 16th of March, or the day after the *Ides*, was the 17th of the *Calends* of April; the 14th of November was the 18th of the *Calendes* of December; the 24th of December was the 9th of the *Calendes* of January. This way of reckoning, was owing to the days answering to, or agreeing with the new moon (viz. from the *Calends* to the *Nones*), with the moon in its second quarter (viz. from the *Nones* to the *Ides*), and the *Ides* at the full of the moon. The day before the *Calends*, the *Ides* and the *Nones* was called *Vigil*, and they said, *Pridie Calendas Nones*, and *Idus*, or day preceding *Calends*, &c. &c.

The Romans divided also the day of the month in *Octaves*, and marked them by the eight first letters of the alphabet; the ninth day, or that which recommenced the eight, was their market days, and called *Nundines*, ninth day.

The Romans, as well as the Greeks, put the night before the day; the night was divided into four watches, *Vigiliæ*, each of which was divided into three hours; the divisions of the night were not equal to those of the day, only at the time of the equinox, but varied according to the seasons. It was not until the time of the Emperors, that the day and the night were divided equal. They called the divisions of the night, *Vesper*, the evening;

Crepusculum, the twilight; *Concubium*, the hour of retiring to bed; *Intempestas*, or *Conticinium*, or the unseasonable hour, or hour of silence; *Media Nox*, midnight; *Gallicinium*, or cock crowing; *Diluculum*, the end of darkness. In the laws of the Twelve Tables, and even unto the first Punic War, the day was designated by the rising and setting of the sun, they then added midday, which was proclaimed by an *Accensus*, a Verger, or Bailif of the Consuls. In process of time, the longest days were divided into twelve hours, and the shortest into ten hours. The principal divisions of the day were, *Lucifer*, the twilight; *Mane*, the day-break; *Ortus*, the rising of the sun; *Meridies*, the mid-day; *Occasus*, the setting sun. The Romans placed great dependance on lucky and unlucky days, and observed them with the most superstitious exactitude. The day after the *Calendes*, the *Nones* and *Ides* were very unlucky days; the 15th of the *Calendes* of August, 18th July, was the most unlucky day of all; the day of *Allia*, a day of misfortune and terror; on these days the Romans celebrated no marriages, went not into the country, nor ventured to engage and give battle. But it must be remarked, that these days were only noticed as influencing them, when they wished to attack their enemies, and not when it was necessary for them to defend themselves.

Roman Months.	*Days.*	*Nones.*	*Ides.*	*Protectors.*	*Signs of the Zodiac.*	*Explanation of the Names.*
Januarius	31	5	13	Juno	Capricorn.	Named from Janus, towhom it was consecrated, and whom some authors believe to be the sun. At this period of the year, the sun begins to revive, and commences the opening of the year.
Februarius	28	5	13	Neptune	Aquarius	From *Februare*, to expiate, to purify, because this month was set apart, or consecrated to the purification of the sacrifices offered for the dead. A month most unhappy.

Roman Months.	*Days.*	*Nones.*	*Ides.*	*Protectors.*	*Signs of the Zodiac.*	*Explanation of the Names.*
Mars	31	7	15	Minerva	Pisces	This month received its name of *Mars*, from the Father of Romulus.
Aprillis	30	5	15	Venus	Aries	The opening month. The earth opens its bosom to receive cultivation; and was consecrated to Venus, the Goddess of Fecundity. *Nero* wished to give his name to the month of April, but this alteration was not allowed him.
Maius	31	7	15	Apollo	Taurus	Thus named, according to some authors, from *Maia*, the Mother of Mercury; according to others, from *Majores*, the antients, or aged citizens—because it was the last month, when the year commenced in June. It was not reckoned fortunate to marry in this month. Nero named it *Claude*.
Junius	30	5	13	Merc.	Gemini	It received its name either from youth and innocency, to whom it was consecrated, or because, when it was the first month, it brought forth the young year—it was the infancy of the year It is also thought, by some, that Junius Brutus gave his name to this month, after having driven the Kings of Rome from their throne. They gave to this month, as well as to September, the name of Germanicus, but it remained but for a short time.
Julius	31	7	15	Jupiter	Cancer	When the year commenced in the month of March, this month was called *Quintilis*; being the fifth, they gave to it the name of Julius Cæsar, after the reformation of the Calendar.
Augustus	31	5	13	Ceres	Lion	In the antient year, this month was called *Sixtilis*, but afterwards they gave to it the name of Augustus, because of the triumphs of this Emperor.
September	31	5	13	Vulcan	Virgo	This month received its name from the place it held in the antient year, and it preserved it, although it was no longer he 7th month of the new

Roman Months.	Days.	Nones.	Ides.	Protectors.	Signs of the Zodiac.	Explanation of the Names.
						one. The Roman Senate, in order to flatter Tiberius, ordained that this month should be called by his name, and afterwards Germanicus; but this innovation did not succeed. Commodus also distributed his names to the five last months of the year, but this Prince was too much abhorred, to induce the Roman people to let his name remain attached to any month. They also gave to the month of September, the name of the Emperor, Antonius Pius; but he would not allow it to remain. It received also that of the Emperor *Tacitus*.
October	31	7	15	Mars	Libra	This being the 8th month in the antient year, they gave to it the name of its place in that year; and it was continued when the year was altered. The Senate wished to give it the name of *Livia*, but it was opposed by Tiberius. They afterwards changed it for that of *Domitian*, but it was not continued, and *Antonius Pius* would not allow it to be called by the name of Faustina, his wife.
November	30	5	13	Diana	Scorpius	The 9th moon of the antient year.
December	31	5	13	Vesta	Arcitenens	The 10th month of the antient year.

It will be necessary to add to what has been said respecting the *Nundines*, that unto the period of the passing of the Law *Hortensia*, towards the year 70, before Jesus Christ, these days were *Néfaste*; that is to say, the Preteurs did not sit in judgment. It was also in these days of the *Nundines*, that the candidates for the magistracy applied to the people for their support.

I am, Sir, your obedient,

Ben. Cook.

Birmingham, July 14, 1827.

On the Explosion of the Steam Boat Boiler, at Lyons in France, a few Months back.

We have just received a communication from an engineer who was present when the accidental explosion of the steam boiler took place at Lyons in France, when the unfortunate Mr. Steel and several other persons lost their lives. As the subject of this letter is well deserving the attention of practical engineers, we think it desirable to communicate an extract. It seems that the engine before the steam was let in, moved with perfect freedom; but when the steam had risen to its proper force 40 to 45 pounds on the inch, and was then for the *first time* admitted into the cylinders, they would not move. Several men were then employed to push at the paddle wheels, but were unable to move them. Mr. Steel thinking that more steam was required, put in more fuel and raised the fire, adding weight to the safety valve, the conseqnence of which was, the dreadful explosion which destroyed him and many others.

On examining the remains of the engine, it was found that the reason why the engine would not move, was the rims of the pistons which had been fitted with great accuracy, had by the sudden admission of the hot steam, expanded faster than the cylinders they were to move in; the consequence of which was, that their edges forced themselves into the cylinders, and they were in a manner grooved into its side, so that nothing but a very extraordinary power could have moved them, and the mode resorted to of forcing them by the power of steam by increasing the temperature, actually set their pistons more firmly. Our informant says, " by so exactly fitting all parts of the engine, such occurrences in the hands of very nice English workmen are not rare, which shews that in engineering as well as in other matters, men may be more nice than wise."

Novel Inventions.

Burstall and Hill's Steam Carriage.

We promised to give, in the present number of our Journal, the specification of the last improvements, for which Burstall and Hill's obtained a patent, and expected, at the same time, to have been able to announce the completion and successful performance of their steam carriage. Our readers will, however, have seen by the public newspapers of the last week, that an accident has occurred, which, for the present, prevents the invention from being exhibited to the public, and of course renders it desirable that our report should be postponed. The boiler, which the patentees have recently adopted, is considerably different from the one described in their first specification, and being made entirely of wrought iron, and of a waggon shape, the bottom was held up by a number of iron straps, and the roof or top provided with two safety valves, one with a weight, rather a small one, the other larger, with a spring.

It seems that the larger valve had not been properly adjusted, and the other had not sufficient aperture to carry off the steam as fast as it was furnished, while the engine was standing still, from which circumstance, an explosion of the boiler took place.

The patentees, in a note to us upon this subject, observe, " one thing seems tolerably well proved, that the plan of carrying the boiler *behind the carriage*, by an additional pair of wheels, is a good one, for if a coach body had been attached, and full of passengers, both inside and outside, not one would have been in the least danger, as neither iron or water would have reached them. This is a most important matter for the consideration of all those who may be lending their aid in the introduction of steam on common roads, as it is well known how disastrous explosions are, when they take place in buildings and steam-boats, whereas this, which was in the open air, was attended with but little personal damage, though twenty people were near it at the time, standing on the top of the bank, and another, who was not at all hurt, had one leg upon that end which exploded." We are glad to find that the patentees are not at all discouraged by the accident, which has shewn them how a similar occurrence may be prevented in future; and as their boiler had completely got them over the most important difficulty which has hitherto presented itself, by affording a plentiful supply of steam, with a moderate weight, we may expect, in a short time, that the subject will be again before the public.

Polytechnic and Scientific Intelligence.

ASTRONOMICAL SOCIETY OF LONDON.

May 11, 1827.

There was read a paper "On the approximate places and descriptions of 295 new double and triple stars, discovered in the course of a series of observations with a 20-feet reflecting telescope; together with some observations of double stars previously known." By the

President. The author prefixes a few remarks to this catalogue of stars, in which he first explains why the places of the stars which it contains are probably materially more exact than those of his former catalogue, especially in right ascension. He then records some results of his observations, either in themselves considered, or in comparison of preceding observations of Mr. South, and some other astronomers. Thus the curious double star, AR 17^h 52^m 1^s, 5, so remarkably situated in the midst of a very large and conspicuous nebula, affords a striking instance how easily the latter class of objects may be overlooked in the usual mode of conducting astronomical observations. Mr. South measured this star in the 5-feet equatorial, but the nebula, which forms so interesting an appendage to it, entirely escaped his notice. The observations of ξ *Ursæ Majoris* supply a satisfactory confirmation of its motion, in conjunction with those of Mr. South in the spring of 1825, its angular motion being found to be about 7^d per annum. Since Mr. Herschel's first observation of this star, in conjunction with Mr. South in 1823, it has described nearly a twelfth of its revolution. This star, therefore, is earnestly recommended to astronomers, as frequent and careful observations upon it can scarcely fail to develope the law of gravitation in that remote system. Both the stars in α *Capricorni* are double: and that usually designated at $\alpha 2$, Mr. H. characterizes as one of the most beautiful and delicate objects in the heavens. The introductory remarks terminate with an account of a curious meteorological phænomenon, which occurred on the 10th of April last. The paper concludes with a catalogue of new double stars, arranged in the manner of the author's former catalogue.

There was next read a paper from Mr. Curnin, the

Superintendent of the Observatory at Bombay, communicating a regular series of observations of moon-culminating stars, on the several previously arranged days for the lunations in the months of February, March, April, May, and a few detached observations on similar stars in August and September, in the year 1825. These observations were made with a transit instrument of only two feet focal length, and little more than two inches aperture, placed in a temporary observatory. The deviation of this instrument from the meridian, in the early part of the observations, was nearly one minute in time; but it is not mentioned whether the deviation was easterly or westerly: and Mr. Curnin remarks that the error of its position on each day is stated "till the smallness of the deduced deviation and the opposite direction of it, were thought to be the effect of the errors of observation; and within narrower limits I have not yet attempted to bring the instrument, as I have not a catalogue on which I could rely for the mean place of stars that are well adapted for the purpose, nor a time-piece of sufficient regularity to justify my dependence on it, nor a meridian mark to guide me in the execution of it." It cannot be expected, therefore, that observations made under such unfavourable circumstances can throw much light on the practical solution of that difficult problem, the determination of the longitude; where the greatest accuracy is necessary. It is understood, however, that a new set of instruments has been lately forwarded to the Observatory at Bombay, at the expense of the East India Company; and the public, therefore, may soon expect to reap the benefit of so laudable an exertion of patronage and public spirit.

New Patents

GRANTED IN IRELAND, IN THE YEAR 1826.

For certain Improvements in the construction or manufacture of Hats. To John Bowler, Surrey, and Thomas Galon, Middlesex. 17th January.

For Improvements in the manufacture of Hat Bodies. To James Blyth Waynman, Middlesex. 9th February.

For an Improvement in the construction of Riding Saddles. To George Tompson, Wolverhampton, Stafford. 11th February.

For certain Improvements in the construction of Diving Bells, or apparatus for Diving under Water.—To Thomas Steele, A. M, Cambridge. 24th February.

For Improvements in the process of and apparatus for Distilling. To Jean Jaques Saintmarc, Vauxhall, Surrey. 22nd March.

For Improvements in Machinery for preparing, drawing, roving, and spinning hemp, and waste silk. To Alexander Lamb, London, and William Suttill, Middlesex. 22nd March.

For an Improved Power Loom for the weaving of silk, cotton, linen, wool, flax and hemp, and all mixtures thereof. To John Harvey, Sadler, Middlesex. 22nd March.

For certain Improvements in the Machinery for carding, and in the Machinery and process for roving, drawing, spinning, and doubling wool, cotton, and other fibrous substances. To John Frederick Smith, Chesterfield, Derby. 22nd March.

For certain Improvements in Machinery for giving the taking up or winding on motion to spools or bobbins, and tubes or other instruments, on which the roving or thread is wound in roving, spinning, and twisting machines. To Henry Houldsworth the younger, Manchester. 22nd March.

For a new preparation of fatty substances, and the application thereof to the purposes of affording light. To Nicholas Hegesippe Manicler, Southwark, Surrey. 30th May.

For an Improvement in Machinery for spinning, and twisting flax, hemp, cotton, and other fibrous substances. To Francis Molineaux, Somerset. 20th May.

For Improved methods of seasoning Timber, and other Wood, To John Stephen Langton, Lincoln. 14th June.

For a New Polishing Apparatus for household purposes. To Joseph Alexander Taylor, London. 18th July.

For certain Improvements in Rotatory Steam Engines, and in the apparatus connected therewith. To Louis Joseph Marie Marquess de Cambis, Middlesex. 4th September.

For Improvements in the construction of carriages, and on harness to be used therewith, whereby greater safety to the persons riding in such carriages, and other advantages will be obtained. To Thomas Cooke, Surrey, 4th September.

For a method of manufacturing or preparing an oil or oils, extracted from certain vegetable substances, and the application thereof to gas lights and other purposes. To Edmond Luscombe, Devon. 24th July.

For a method of applying Steam without pressure, to pans, boilers, coppers, stills, pipes, and machinery, in order to produce transmit and regulate various temperatures of heat in the several processes of boiling, distilling, evaporating, inspissating, drying, and warming, and also to produce power. To Richard Mec Raikes, London. 2nd December.

For an Engine or Instrument for effecting a vacuum, and thus producing powers, by which water may be raised, and machinery put in motion. To Samuel Brown, Middlesex. 8th December.

New Patents Sealed, 1827.

To Henry Raper, of Baker Street, in the Parish of St. Marylebone, in the County of Middlesex, Esq. a Rear Admiral in our Royal Navy, for his having found out, or invented a new and improved system of signals, first for communicating by day, by the means of flags and pendants between ships at sea, or other objects far distant from each other; in which system the colours of the flags and pendants which have heretofore served to distinguish the signals one from another, and which by distance or other causes, are extremely subject to be mistaken may be dispensed with altogether; and secondly, for communicating by night between ships at sea, and other objects far distant from each other, by the means of lights. And which system of signals is more conspicuous, expeditious, and certain than any which has hitherto been employed for the like purpose—Sealed 21st June—2 months.

To James Marshall, of Chatham, in the County of Kent, Lieutenant, in the Royal Navy, for his invention of improvements in mounting guns or cannons for sea or other service—26th June—6 months.

To John Felton, of Hinckley, in the County of Leicester, machine maker, for his invention or having found out a machine for an expeditious and correct mode of giving a fine edge to knives, razors, scissors, and other cutting instruments—28th June—2 months.

To Thomas Fuller, of Bath, in the County of Somerset, coach maker, for his invention of certain improvements on wheel carriages—28th June—2 months.

To Walter Hancock, of Stratford, in the County of Essex, Engineer, for his invention of an improvement or improvements upon steam engines—4th July—6 months

To William Wilson, of Martin's Lane, Cannon Street, in the City of London, hat manufacturer, for his having invented or found out the means or principle of extracting spirits and other solvents used in dissolving, malleable gums of various kinds, and other articles employed for stiffening hats, hat bodies, bonnets, caps, and divers articles of merchandizes, and converting such spirit (after rectification) into use—4th July—2 months.

To Rene Florentin Jenar, of Bunhill Row, in the Parish of St. Luke, Gentleman, for his invention of certain improvements in lamps—4th July—6 months.

To George Boulton, of Stafford Street, Old Bond Street, in the County of Middlesex, tailor, for his invention of an instrument, machine, or apparatus for writing, which he denominates a self-supplying pen—4th July—6 months.

To Thomas Sowerby, of Change Alley, Cornhill, in the City of London, merchant, for his invention of certain improvements in the construction of ships wind lasses—4th July—2 months.

To Rene Florentin Jenar, of Bunhill Row, in the Parish of St. Luke, Gentleman, for his invention of a new method of filling up with metal or other suitable material the holes or insterstices in wire gauze, or other similar substances which he denominates metallic linen—4th July —6 months.

To John Snelson Shenton, of Husband, Bosworth, in the County of Leicester, plumber and glazier, for his having invented or found out certain improvements in the mechanism of water closets—12th July—2 months.

To Edward Barnard Deeble, of St. James's Street, Westminster, in the County of Middlesex, civil engineer, for his invention of a new construction or constructions, and combination or combinations of metallic blocks, for the purposes of forming caissons, jetties, piers, quays, embankments, light houses, foundations, walls, or such other erections to which the said metallic blocks may be applicable—12th July—6 months.

To Robert Vazie, of York Square, in the Parish of St Pancras, in the County of Middlesex, civil engineer, for his invention of improvements in certain processes, utensils, apparatus, machinery, and operations applicable to the preparing, extracting, and preserving various articles of food, the component parts of which utensils, apparatus, and machinery, are of different dimensions proportionate to the different uses in which they are employed, and may be separately applied in preparing, extracting, and preserving food, and in other useful purposes—12th July—6 months

To William Church, of Birmingham, in the County of Warwick, Esq. for his invention, and having found out certain improvements in apparatus for spinning fibrous substances—13th July—6 months.

To George Anthony Sharpe, of Putney, in the County of Surrey, Esq. for his invention of an improved table urn 18th July—6 months.

To Robert More, of Underwood, Stirlingshire, in that part of our United Kingdom called Scotland, Distiller, in consequence of communications made to him by certain foreigners residing abroad, and discoveries made by himself, for certain improvements in the process of preparing and cooling worts, or wash from vegetable substances, for the production of spirits—18th July—6 months.

To Robert More, of Underwood, Stirlingshire, in that part of our United Kingdom called Scotland, Distiller, in consequence of communications made to him by certain foreigners residing abroad, and discoveries made by himself, for certain processes for rendering distillery refuse productive of spirits—18th July—6 months.

CELESTIAL PHENOMENA, FOR AUGUST, 1827.

D.	H.	M.	S.	
1	5	0	0	☽ in conj. with 4 ζ in Libra
1	19	0	0	☽ in conj. with 1 β in Scorpio
1	19	0	0	☽ in conj. with 2 β in Scorpio
1	21	0	0	☽ in conj. with γ in Scorpio
3	0	0	0	☽ in conj. with ϱ in Oph.
3	21	0	0	☽ in conj with 2 μ in Sagitt
5	0	0	0	Clock before the ☉ 5' 43"
5	22	0	0	☽ in conj. with β in Capri.
6	17	40	0	Ecliptic Opposition or ◉ Full Moon.
6	23	0	0	♂ in conj. with δ in Cancer.
9	7	0	0	☿ in conj. with ο in Leo.
11	4	0	0	☾ in conj. with ϵ in Pisces.
13	19	0	0	♀ in conj. with δ in Cancer.
13	23	48	0	☾ in □ last quarter.
15	0	0	0	Clock before the ☉ 4′ 19″
15	6	0	0	☾ in conj. with ϵ in Taurus
17	16	0	0	☾ in conj. with γ in Gemini
20	0	0	0	Clock before the ☉ 3′ 16″
20	16	0	0	☾ in conj. with 1 α in Cancer
20	17	0	0	☽ in conj. with 2 α in Cancer
21	3	0	0	♀ in conj. with ♂ long. 14° in Leo ♀ lat. 58′ N. ♂ lat. 1° 8' diff. lat. 10′
22	0	0	0	☿ Stationary.
22	2	31	0	Ecliptic conj. or ● New Moon
22	15	0	0	♄ in conj. with δ in Gemini
23	11	42	0	☉ enters Virgo.
24	0	0	0	☽ in conj. with υ in Leo.
25	0	0	0	Clock before the ☉ 2′ 2"
26	3	0	0	☽ in conj. with α in Virgo.
27	17	0	0	☽ in conj. with λ in Virgo.
27	17	0	0	☽ in conj. with 2 α in Libra.
28	11	0	0	☽ in conj. with 4 ζ in Libra
29	1	0	0	☽ in conj. with 1 β in Scorpio
29	1	0	0	☽ in conj. with 2 β in Scorpio
29	9	21	0	☽ in conj. with γ in Scorpio
29	9	21	0	☽ in □ first quarter.
30	0	0	0	Clock before the ☉ 38″
30	19	0	0	☿ in conj. with α in Leo.

waxingThe ☽ moon—the waning ☾ moon

Rotherhithe. **J. LEWTHWAITE.**

METEOROLOGICAL JOURNAL FOR JULY, 1827.

1827.	Thermo.		Barometer.		Wind.	Weather.
	Max	Min.	Morn.	Even.		
JULY.						
1	71	59	29,56	29,67	S	Cloudy—fair
2	65	54	29,71	29,60	S—W	Rain ,88
3	70	54	29,63	29,85	S—S W	Fair—sun—clouds
4	74	56	29,97	29,94	S W—W	Do. evening—rain ,12 inch
5	72	54	30,06	30,24	N—N E	Fair—clear
6	77	50	30,23	30,18	N E—S E	Ditto—ditto
7	79	63	30,20	30,20	W—N W	Ditto—ditto
8	82	61	30,20	30,15	N W	Ditto—ditto
9	81	62	30,12	30,02	W	Ditto—ditto
10	78	58	30,—	29,83	W	Ditto—ditto
11	76	55	29,87	29,95	W—N W	Ditto—ditto—slight shower
12	76	50	30,—	30,02	N—N E—S	Ditto—ditto
13	75	57	30,02	——	S—S E	Ditto—ditto
14	74	55	——	29,95	E—N E	Ditto—ditto
15	76	54	29,93	29,88	N E	Ditto—ditto
16	76	59	29,88	——	E—S E	Ditto—ditto
17	80	60	——	29,84	S	Ditto—ditto
18	75	61	29,82	——	W	Cloudy—slight shower
19	68	60	29,84	29,60	W	Ditto—rain ,12
20	71	55	29,57	29,65	W—N W	Fair—clear
21	68	56	29,73	29,82	N W	Cloudy—sun—slight shower
22	65	57	29,83	29,79	W—S E	Rain ,25
23	70	57	29,83	29,90	W—S W	Ditto ,32
24	75	62	29,92	29,84	W—S W	Fair—cloudy
25	69	58	29,80	29,89	W—N W	Rain ,25
26	69	69	29,93	29,73	S W—W	Ditto ,25
27	76	59	29,92	29,95	N W—W	Fair—sun—clouds

HITCHIN, HERTS. **WATSON PERKS.**

METEOROLOGICAL JOURNAL, MAY AND JUNE, 1827.

1827.	Thermo.		Barometer.		Wind.	Weather.
	Max	Min.	Morn.	Even.		
MAY						
27	65	51	29,41	29,48	W.	Sun—clouds—slight shower
28	63	54	29,48	29,59	S.—S. W.	Cloudy—ditto
29	65	53	29,54	29.63	W.—S. W.	Ditto—ditto
30	69	56	29,72	29,62	W.	Sun—clouds
31	67	50	29,52	29,60	S. W.	Ditto—slight shower—thunder
JUNE.						
1	66	51	29,52	29,62	S. W.	Ditto—ditto
2	60	47	29,56	29,45	S. W.	Rain .12.
3	63	49	29,63	29,68	N. W.	Cloudy—showers
4	68	49	29,72	29,70	N. W.	Ditto—Ditto
5	60	47	29,70	29,47	S. W.	Ditto—Rain ·07
6	61	49	29,46	29,57	N.—N. W.	Sun and clouds
7	63	46	29,75	29,89	N.—N. W.	Ditto—slight shower
8	68	43	30,01	30,08	N.—N. E.	Fair—Clear
9	72	54	30,12	30,12	N. E. —N.	Ditto
10	67	54	30,11	30,05	N. E.—E.	Ditto—cloudy
11	73	52	30,03	29,98	N. E.	Fair clear
12	73	55	29,98	29,97	N. E.—E.	Ditto—ditto
13	74	54	29,97	29,89	N. E.—E.	Ditto—ditto
14	76	55	29,82	29,69	N. E.—E.	Ditto—ditto
15	68	56	69,69	——	S. E.—S.	Cloudy—damp
16	66	58	——	29,69	S. W.—W.	Ditto—slight rain
17	67	60	29,72	29,72	S. W.	Ditto—ditto 08
18	67	60	29,81	29,80	N. W.	Sun—clouds
19	68	57	29,77	29,66	N. W.—W.	Ditto—ditto
20	68	54	29,67	29,69	W.	Ditto—rain .06
21	65	51	29,71	29,73	W.	Cloudy—ditto ·05
22	65	52	29,82	29,88	W.	Ditto—slight showers
23	65	49	29,91	29,91	N. W.—N.	Fair—cloudy
24	68	50	29,93	29,93	N.—N. E.	Ditto—ditto—sun
25	68	54	29,92	29,89	N. E	Ditto—Ditto—Ditto
26	74	57	29,88	29,83	N.—N. W.	Fair—clear
27	70	56	29,78	29,58	S W.	Cloudy—slight rain
28	66	56	29,45	29,50	S. W—S	Rain .36
29	70	58	29,47	29,58	S. W.	Fair—sun—clouds
30	72	57	29,59	29,69	S. W.	Sun—clouds—showers

Hitchen, Herts. **WATSON PERKS.**

METEOROLOGICAL JOURNAL FOR JUNE AND JULY, 1827.

1827.	Thermo.		Barometer.		Rain in inches.	1827.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low	
MAY						JULY.					
26	73	44	29,99	29,97		11	73	52	30,00	29,95	
27	67	50	29,88	29,70		12	78	42	30,10	30,07	
28	61	54	29,60	stat.	,175	13	73	45	30,10	stat.	
29	69	45	29,62	29,56	,3	14	74	42	30,10	30,04	
30	70	52	29,80	29,66	,025	15	73	46	30,00	29,98	
JULY.						16	76	48	29,98	29,96	
1	70	58	29,70	29,66	2025	17	80	41	29,96	29,95	
2	69	54	29,82	29 70	,175	18	76	45	29,90	stat.	
3	71	52	29,90	29,73	,125	19	70	48	29,90	29,80	
4	71	48	30,08	30,05		20	71	56	29,66	29,64	,025
5	69	47	30,27	30,09	,125	21	71	45	29,87	29,80	
6	76	40	30,30	30,29		22	59	42	29,90	29,87	
7	81	53	30,29	stat.		23	71	53	29,94	29,90	,05
8	75	52	30,29	30,27		24	73	56	29,96	29,94	
9	82	52	30,20	30,13		25	73	57	29,89	29,88	
10	78	50	30,09	29,90							

LOWER EDMONTON. **CHARLES H. ADAMS.**

LITERARY AND SCIENTIFIC NOTICES.

Diorama.—Notwithstanding the advanced state of the season, this interesting exhibition continues daily to attract numerous and fashionable companies. The scene of ruins, with a fog gradually dissipating, has a most imposing and novel effect, and is in no respect inferior to the Rosby Chapel, or any of its predecessors; but the view of St. Cloud is, perhaps, one of the finest landscapes that ever was produced. The spectator might contemplate this scene for hours, and discover new objects every moment. The distant view of Paris is very finely introduced, and to those who are acquainted with the neighbourhood, gives great interest to the picture. Our limits will not allow us to enlarge upon the merits of this exhibition, but we strongly recommend it to every admirer of the fine arts, and of picturesque scenery.

Mr. J. R. Young, author of an Elementary Treatise on Algebra, has in the press, the Elements of Geometry, containing a New and Universal Treatise on the Doctrines of Proportion, together with Notes, in which are pointed out, and corrected, many important errors, that have hitherto remained unnoticed in the writings of Geometers. Also, an Examination of the various Theories of Parallel Lines that have been proposed by Legendre, Bertrand, Ivory, &c.

Mr. T. F. Hunt, whose recent work on Picturesque, Domestic Architecture, and Designs for Parsonage Houses, has obtained so much approbation, has nearly ready for the press, another work on Domestic Architecture, entitled Architettura Campestre, designed to exhibit the character of rural buildings in the Italian style.

The Second Part of that superb work, the Illustrations of England and Wales, from the drawings of Turner, has been published; among the views, is one of Colchester, with the Castle most beautifully executed; there is also one of the Fall of the Tees, with a remarkably fine distance. One of Richmond, in Yorkshire, is a neat picturesque subject, so is also the view of Launceston. The subjects are engraved by Wallis, Goodall, W. R. Smith, and Varrel, and in every way equal, if not superior to the first part.

In the first week of August will be ready, in two vols. post 8vo. by Captain Andrews, of the East India Company's service, a Journal of a Route from Buenos Ayres, through the provinces of Cordova, Tueuman and Sulta, to Potosi, thence by the deserts Caranja, to Arica, and subsequently to Coquimbo, with general Observations; and an Appendix, with Documents relating to the Authors proceedings in behalf of the Chilian and Peruvian Mining Company.

Nearly ready for publication, the History of Portugal, from the earliest times to the commencement of the Peninsular War, by Robert Southey, Esq.

Dr. Brewster has announced, as preparing for press, a system of Popular and Practical Science.

The object of the publication is to furnish the educated classes of both sexes, with a series of popular works on the various branches of science, suited to the humblest capacities, and yet capable of imparting scientific knowledge to the best informed ranks of society.

French Canal.—The project for constructing a canal, which shall render Paris a sea port, and open a communication between Havre and Strasbourg, is still the subject of considerable discussion in France. Mr. Dupin endeavoured to prove, by a paper which he read before the Academie des Science, that the execution of this gigantic scheme is not beyond the power of modern inventions, and the resources of the nation.

Royal Society. In consequence of Sir H. Davy intending to remain abroad, that gentleman has resigned the office of President of the Royal Society. Two gentlemen, Mr. Peel and Mr Davies Gilbert, are severally spoken of as likely to become his successor.

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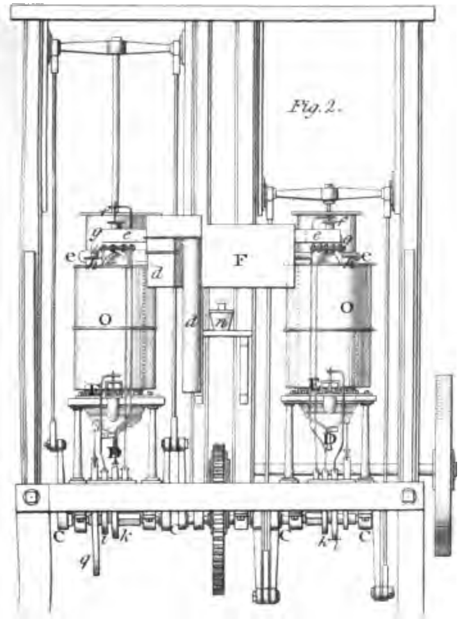
NOV 7 1817

Hazard's Explosive Engine.

Fig. 2.



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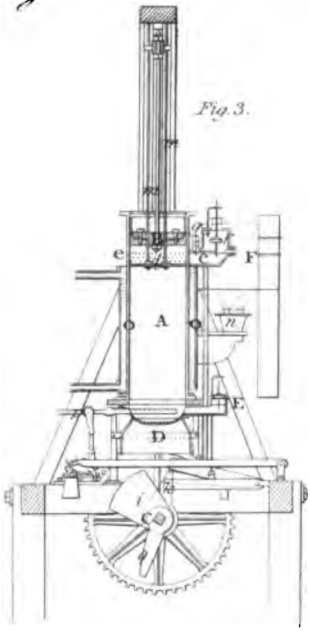

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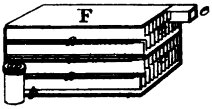
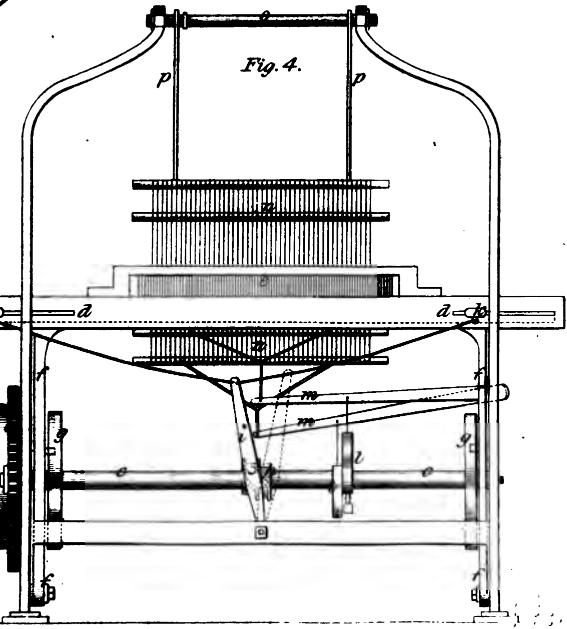


Hanchett & Dalvalle's Imp^d. Loom.

Fig. 4.



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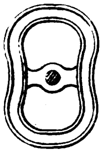

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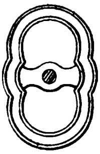

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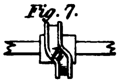

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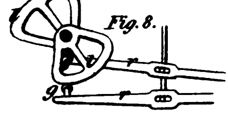

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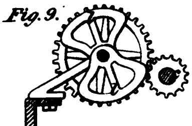


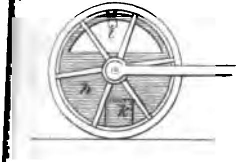
W. Newton del^t.

1^st March 1827.

S. Bellin Sculp^t.

Biddle's Machine for repairing roads.

Fig. 9.



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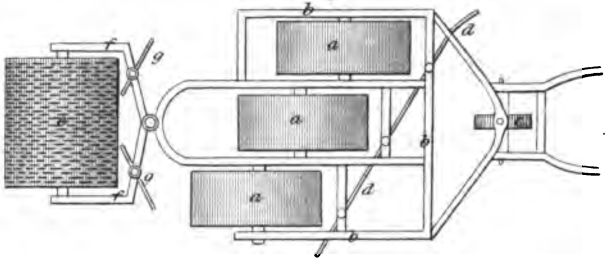
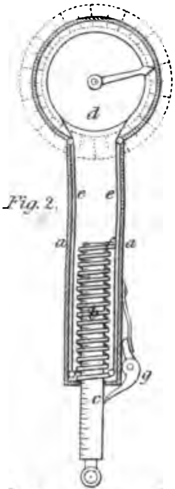


Cosnahan's Ship-meter.

Fig. 2.



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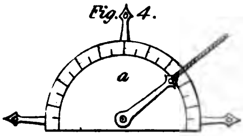

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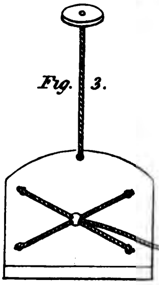
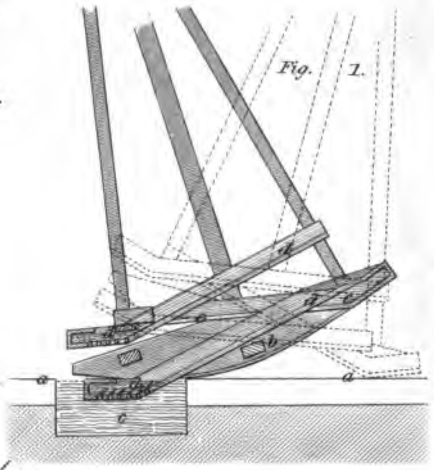
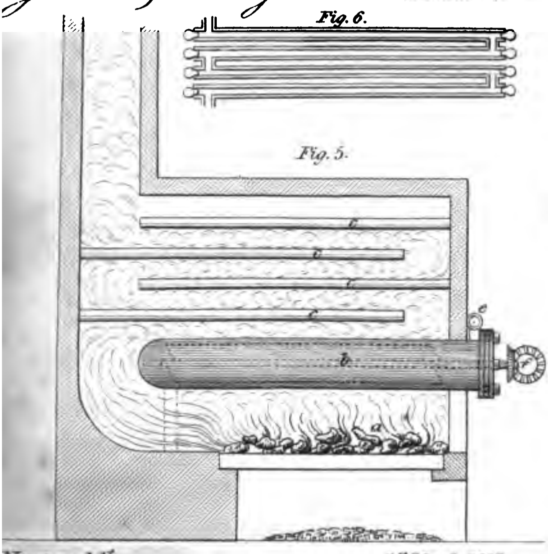


Cabanal's Machine for raising Water.

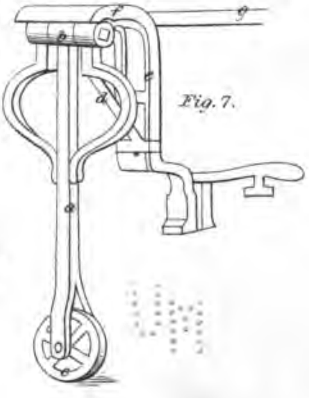


Gillman & Sowerby's Steam Boiler.



Pyke's Prop for Carriages.

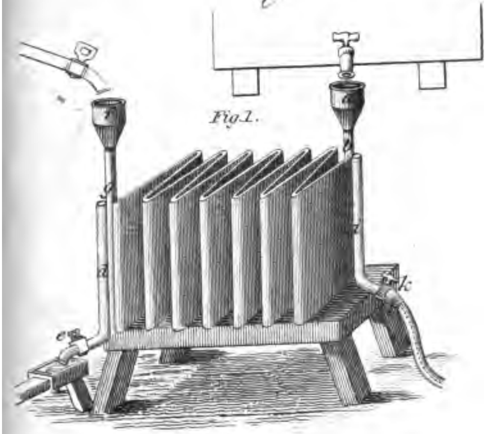
Fig. 7.



Newton del.ᵗ 1.st March 1827. T. Owen sculp.ᵗ

Yandal's Refrigerators.

Fig. 1.



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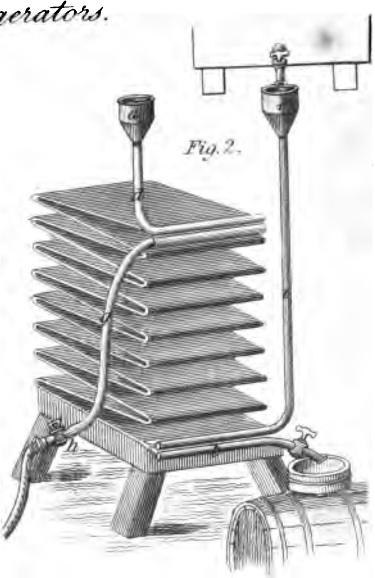

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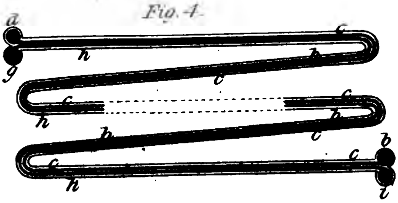

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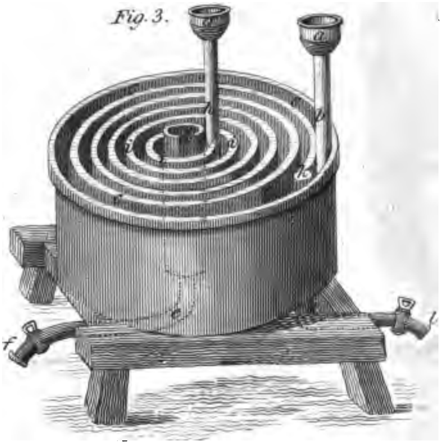
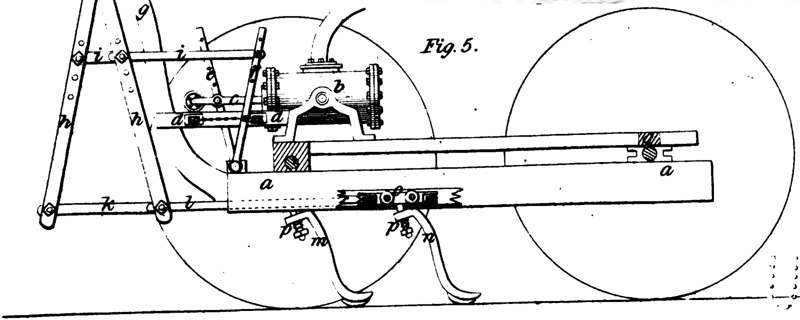


Gurney's loco-motive Carriage.

Fig. 5.



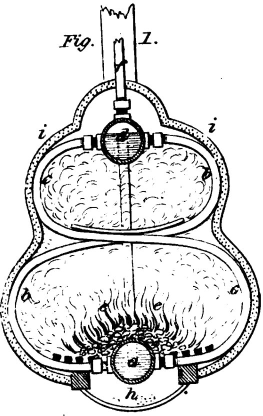
W. Newton del^t

1^st April 1827.

S. Bellin sculp^t

Gurney's Steam Boilers.

Fig. 1.



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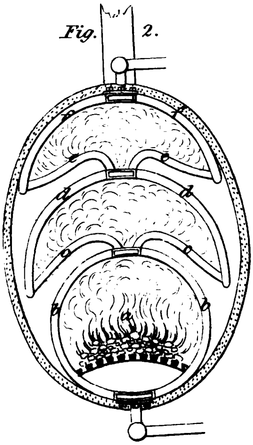

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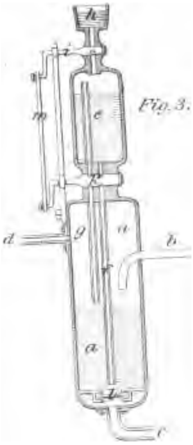
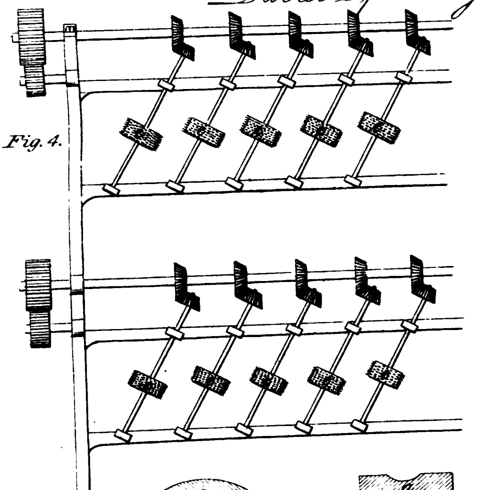


Davis's Spinning Machinery.

Fig. 4.



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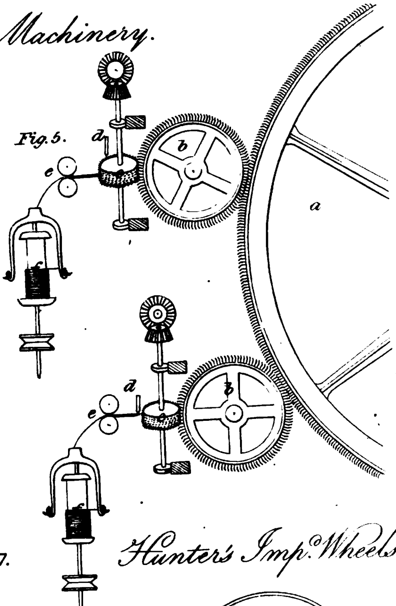
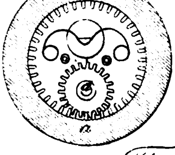


Hunter's Imp^d Wheels.

Fig. 6.



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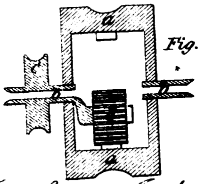

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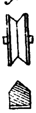

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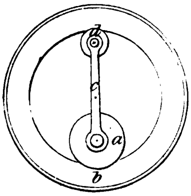
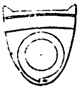


Thin's Smoke Jack.

Fig. 12.



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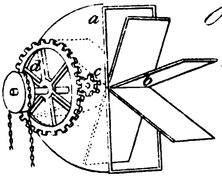

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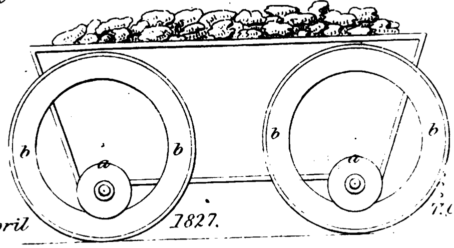


Day & Hall's Lace Machinery.

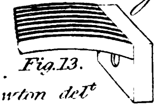
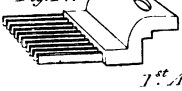


Fig. 13.

Fig. 14.



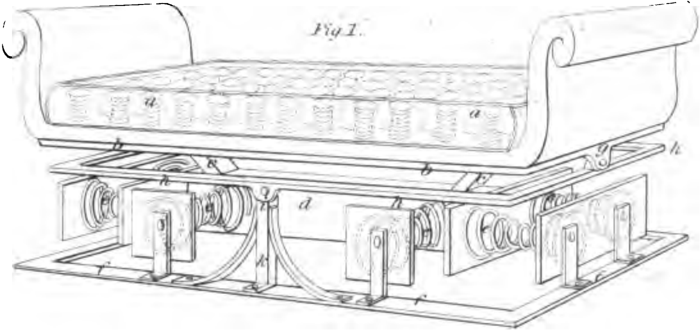
Newton del^t

1st April 1827.

Pratt's Sea Couch.

PLATE V.

Fig. 1.



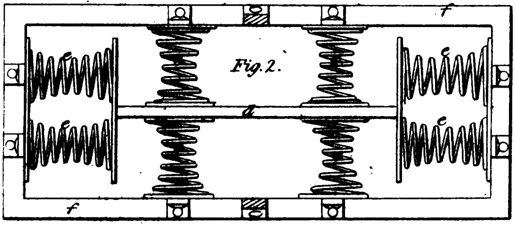


Fig. 2.

Weatherley's Machine for Splitting and binding fire wood.

Fig. 4.

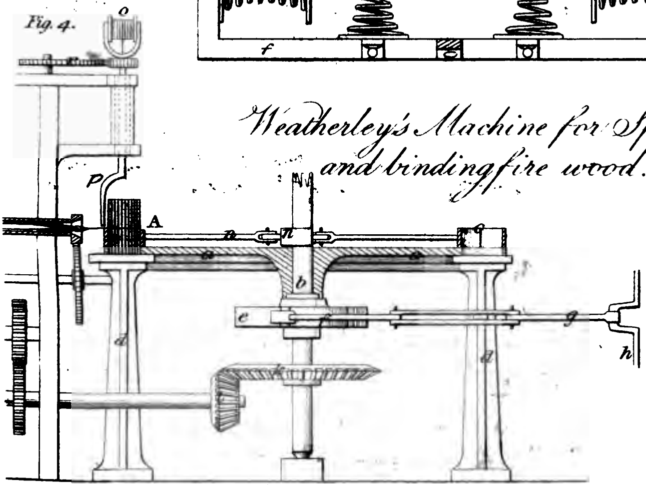
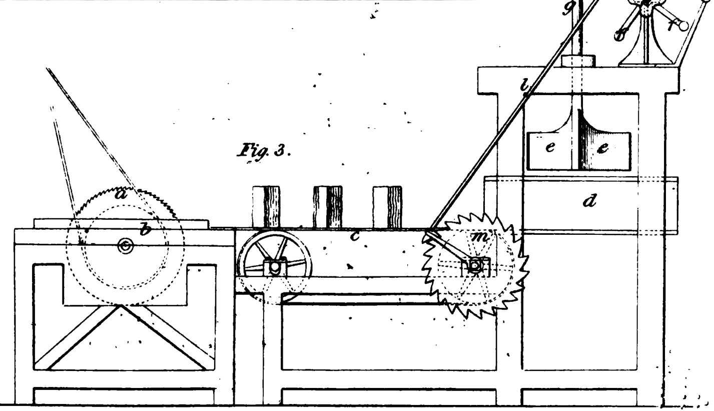


Fig. 3.



W. Newton del.t 1st May 1827. S. Bellin sculp.t

Galloway's Machine for making Bricks.

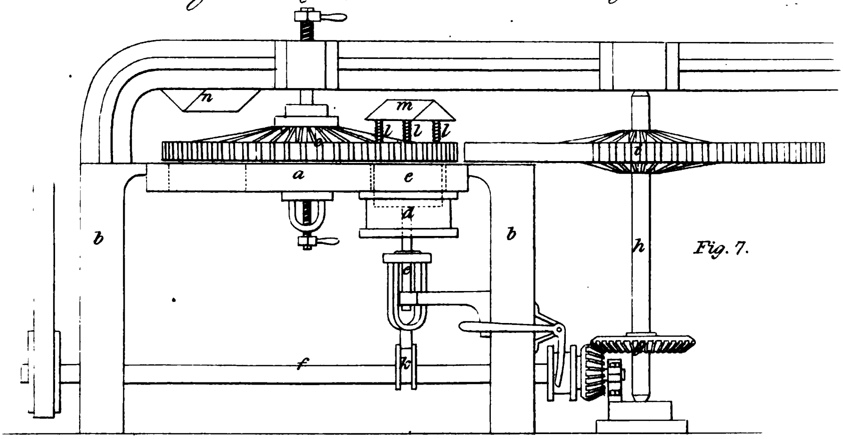


Fig. 7.

Ulrich's Impd Chronometer.

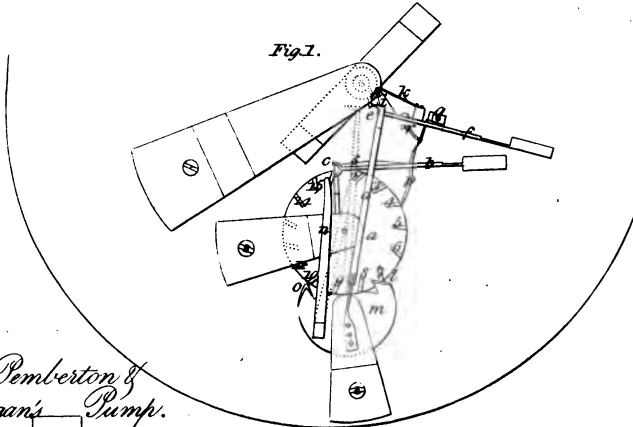
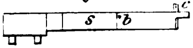


Fig. 1.



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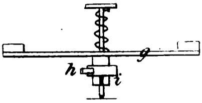
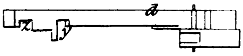


Fig. 3.



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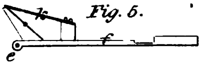

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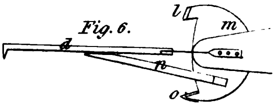


Fig. 6.

Pemberton & Morgan's Pump.

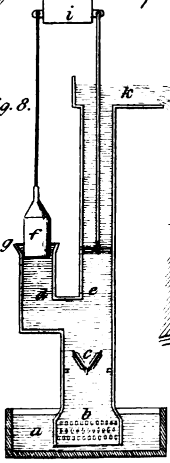
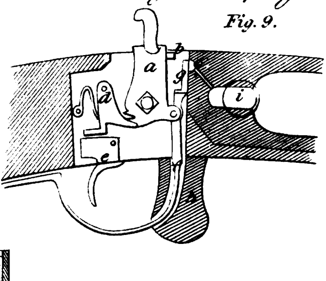


Fig. 8.

Downing's Impd Gun-lock.



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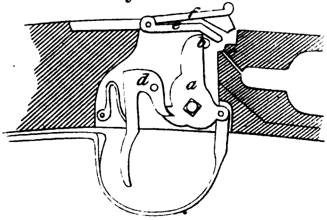
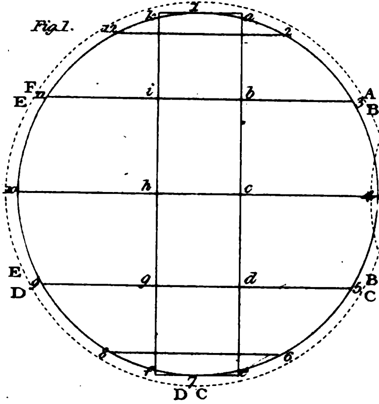


Fig. 10.

W. Newton delt. 1st May 1827. T. Owen sculpt.

Perkins on high pressure Steam. PLATE VII.

Fig. 1.



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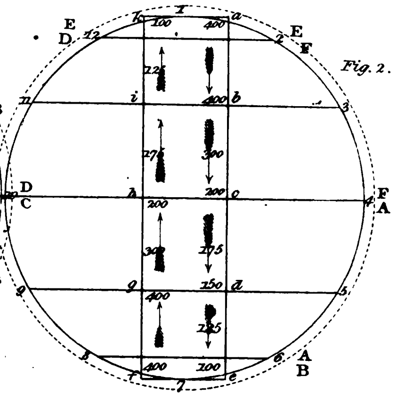
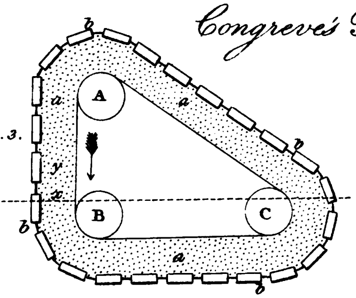


Congreve's Perpetual motion.

Fig. 3.



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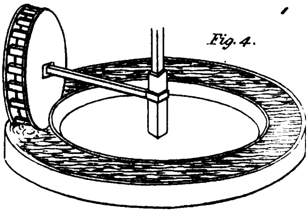

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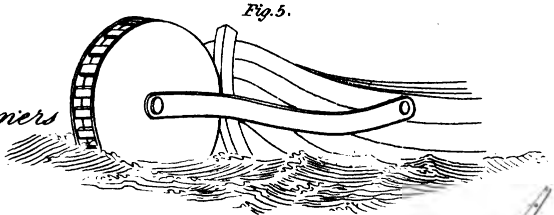
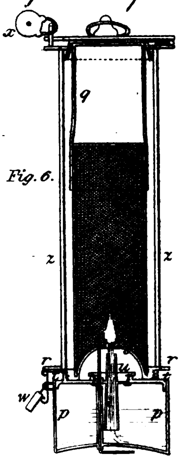


Roberts's Miners Safe lamp.



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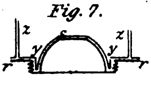
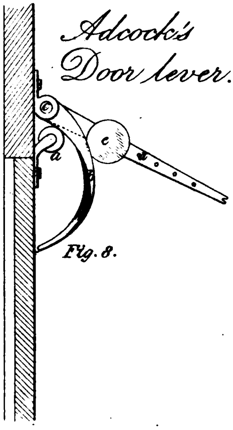


Fig. 7.

Adcock's Door lever.



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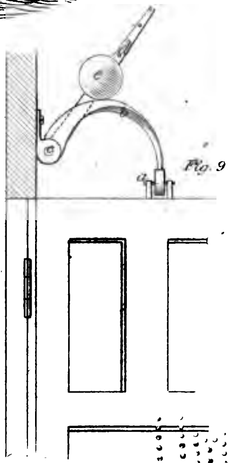


Fig. 9.

W. Newton delt.

1st May 1827.

S. Bellin sculpt.

Worthington & Mulliner's Loom.

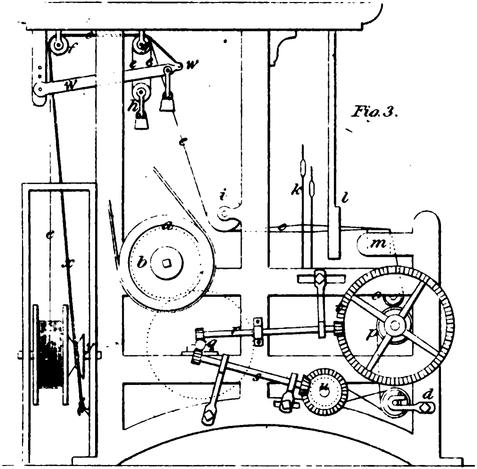


Fig. 3.

Saintmarc's Distilling Apparatus.

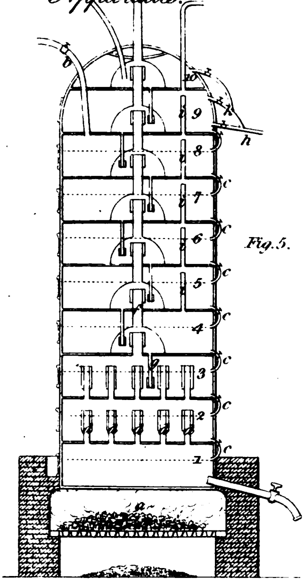


Fig. 5.

Grimble's Distilling App.^s

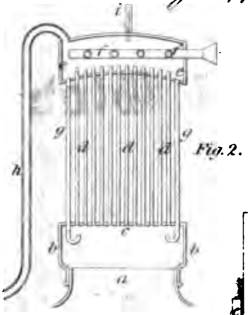


Fig. 2.

Young's Improved Lock.

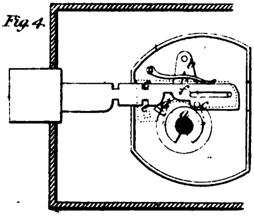


Fig. 4.

Gursed's Machinery for Dressing Flax.

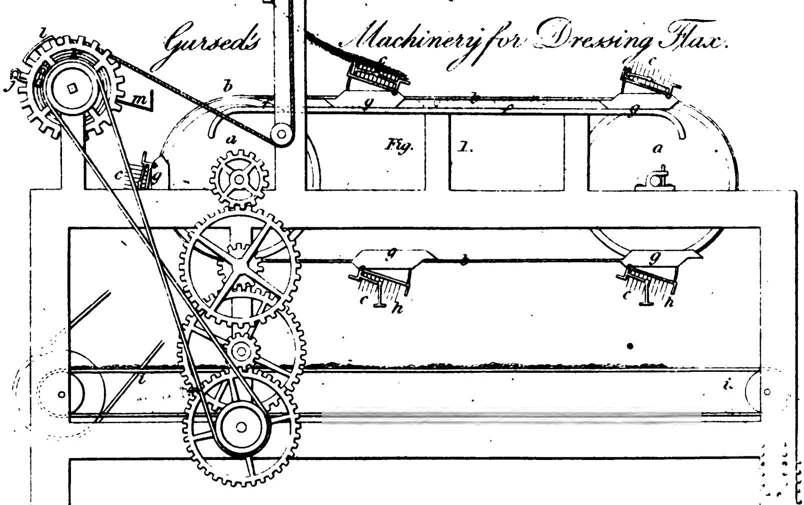


Fig. 1.

Sillington's Shearing Machinery.

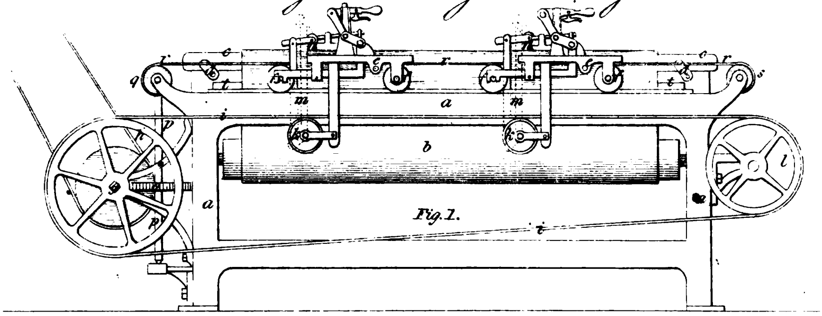
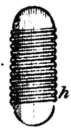


Fig. 1.

Goode's Circular Headed Window Blind.

Jenour's Shot Cartridge.



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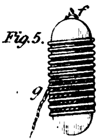

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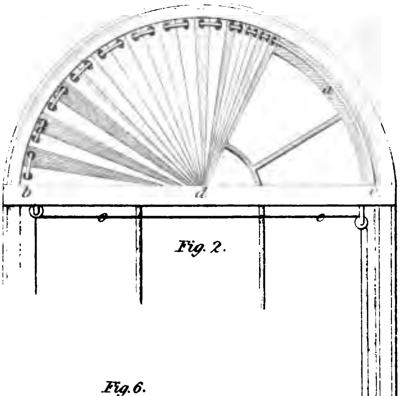

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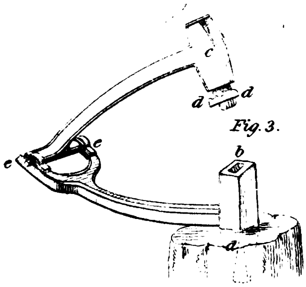


Fig. 3.

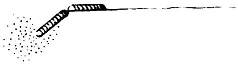


Fig. 6.

Albert's Military Oven.

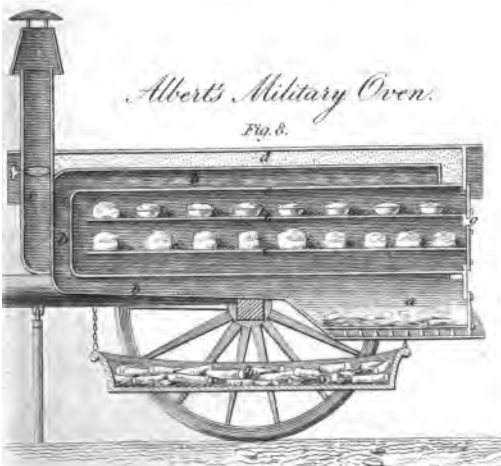


Fig. 8.

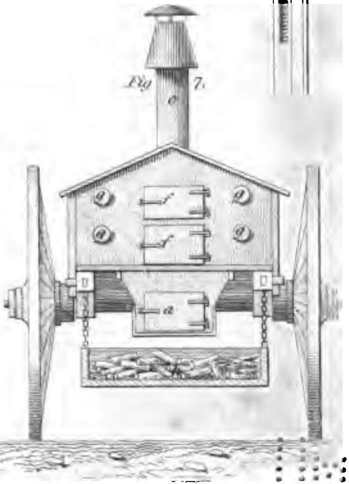
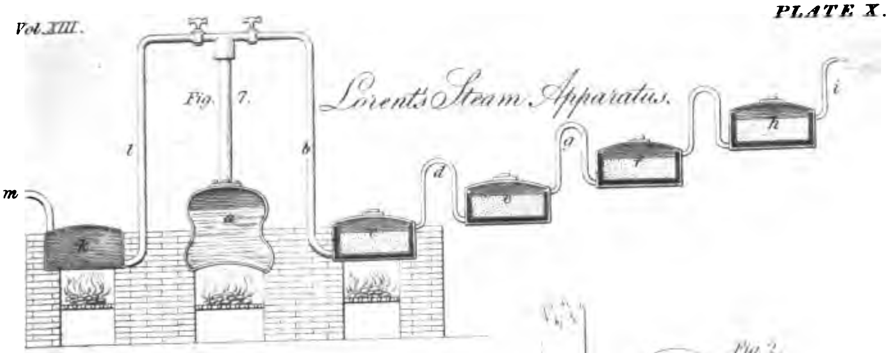


Fig 7.

W. Newton del.t 1st June 1827. S. Bellin sculp.t

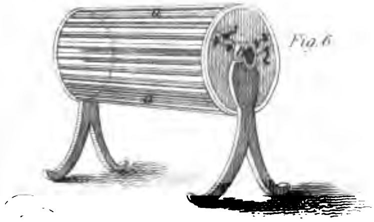
Lorent's Steam Apparatus.

Fig. 7.



Jacomb's Furnace.

Fig. 6.



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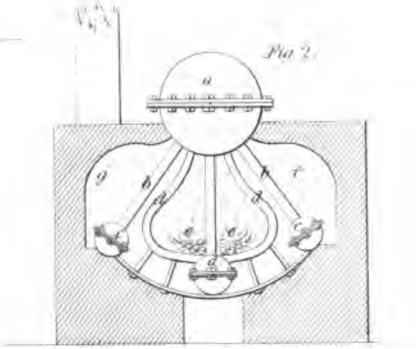

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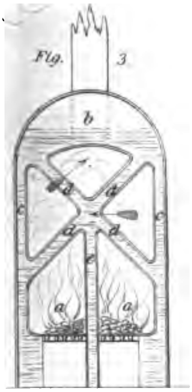
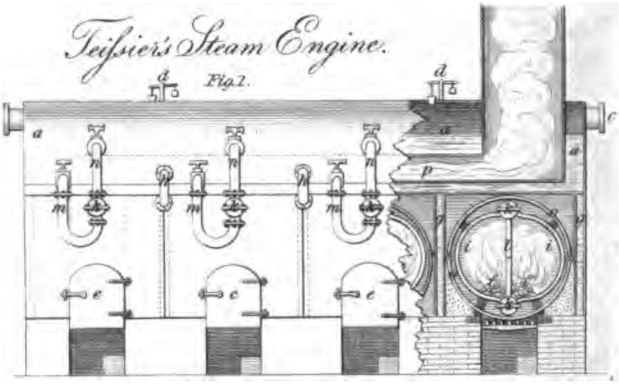


Teiſsier's Steam Engine.

Fig. 1.



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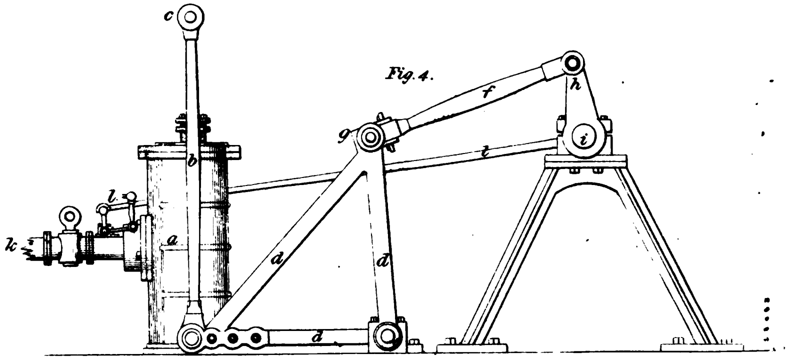


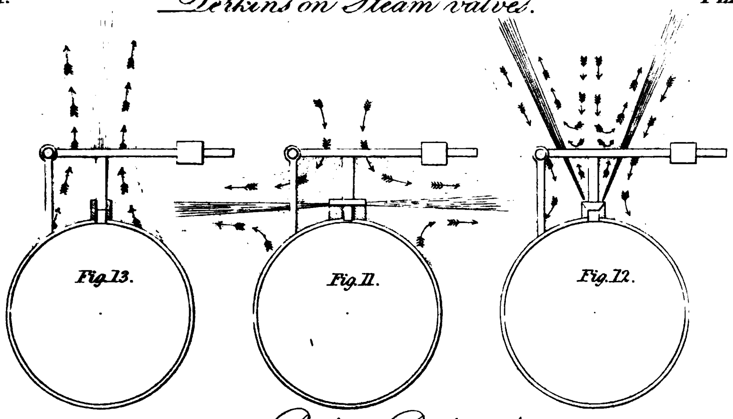
W. Newton delt.

1st July 1827.

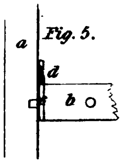
S. Bellin sculpt.

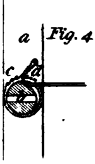
MU

Perkins' on Steam valves.



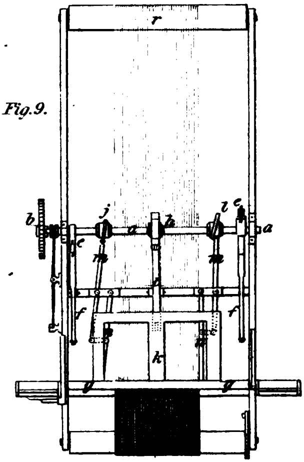
Perkins' Bedstead.





Sadler's Power loom.

Fig. 9.



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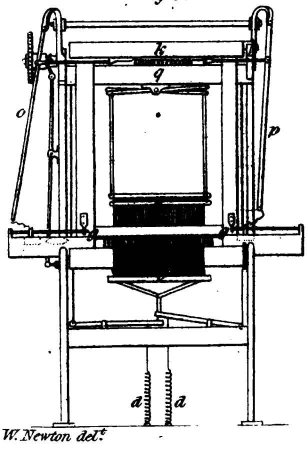
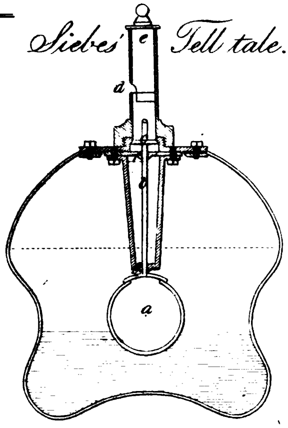
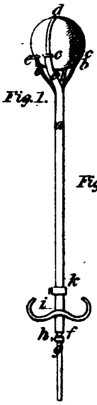


Siebe's Tell tale.



Lukin's Surgical Instrument.

Fig. 1.



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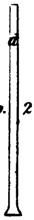
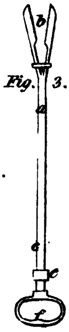


Fig. 3.



Fanshaw's Spinning Apparatus.

Fig. 6.

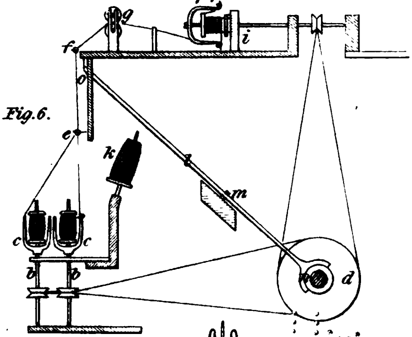
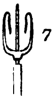
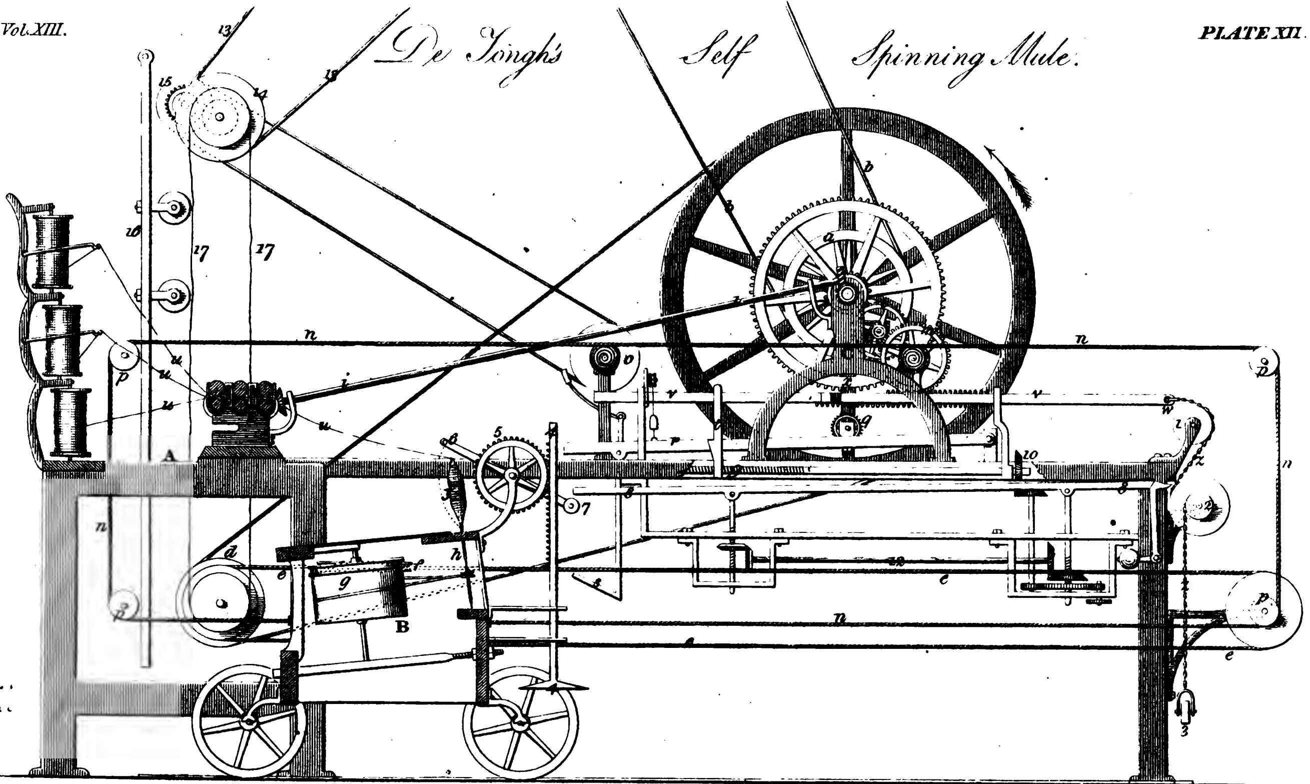


Fig. 7.



W. Newton del.t
1st July 1827.
T. Owen sculp.t

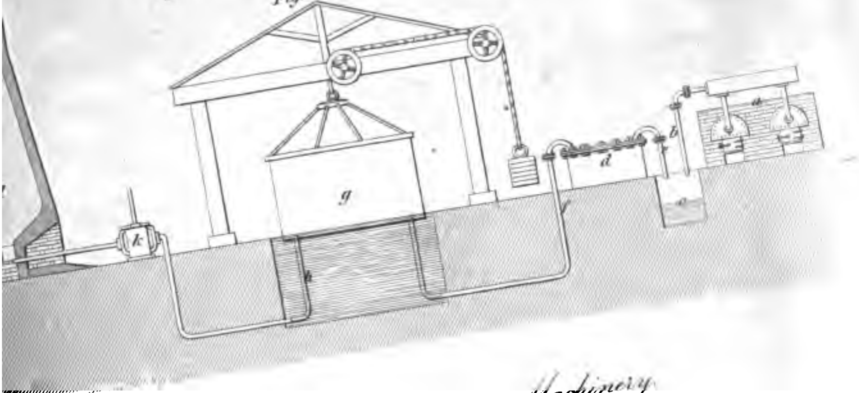
De Jongh's Self Spinning Mule.



W. Newton delt. 1st August 1827. F. Mansell sculpt.

Taylor's mode of making Iron.

Fig. 3.



Royle's Spinning Machinery

Fig. 2.

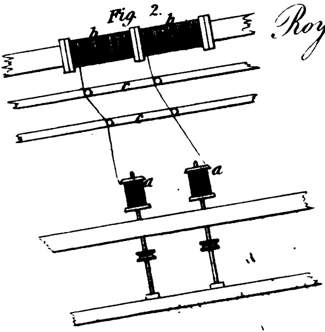


Fig. 1.

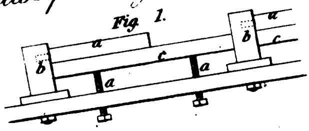


Fig. 5.

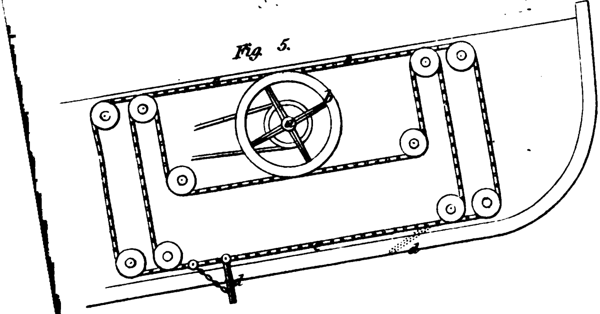
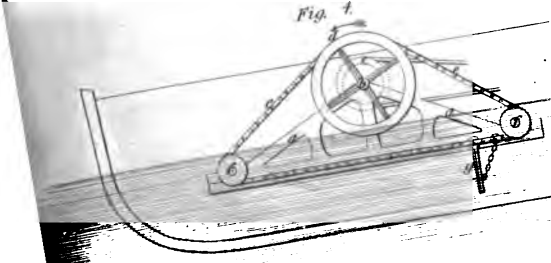
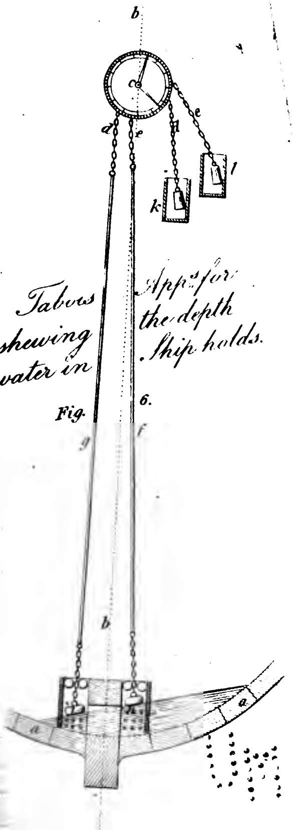


Fig. 4.



Tabors Apps. for shewing the depth of water in Ship holds.

Fig. 6.



T. (h

1 August 1827.

Newton del.

Lacey's Carriage Springs.

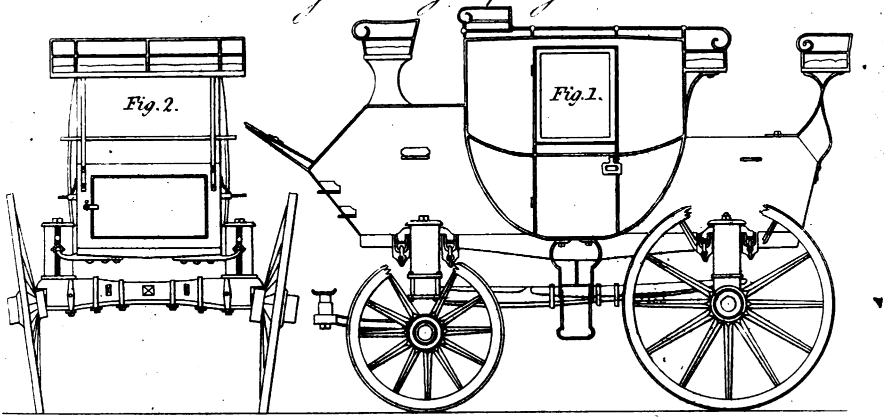


Fig. 2.
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Fig. 8.

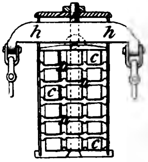
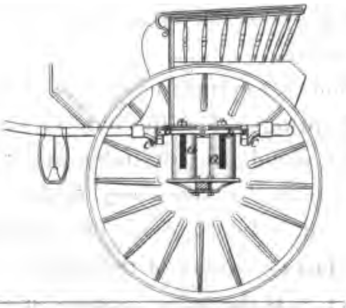


Fig. 10.



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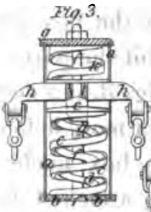

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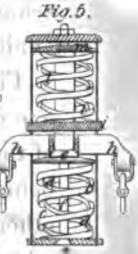

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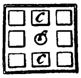
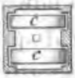


Fig. 7.



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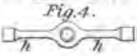

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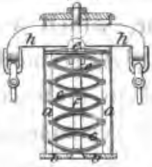
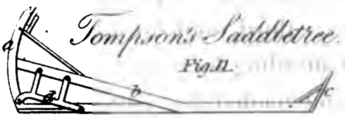


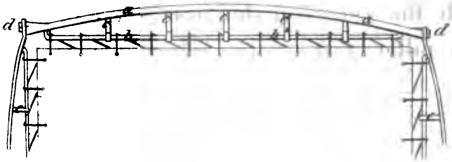
Tompson's Saddletree.

Fig. 11.



Tomlinson's Bedstead

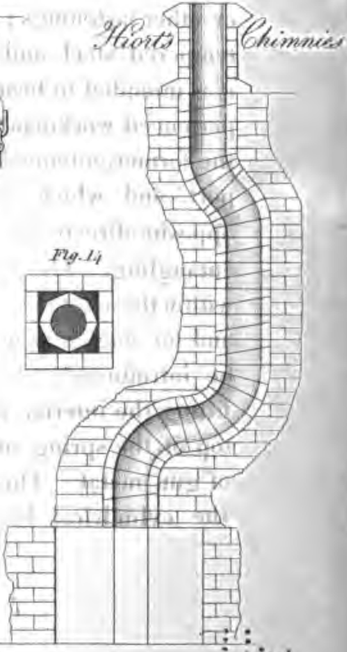
Fig. 12.



Hiort's Chimnies

Fig. 13.

Fig. 14.



W. Newton delt 1st August 1827. S. Bellin sculp

C